SOCIAL IMPACT ASSESSMENT

FOR

STEYNSRUS 10MW PV SOLAR FACILITY

FREE STATE PROVINCE

FEBRUARY 2023

Prepared for

CRRENEWABLES (PTY) LTD

By

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EXECUTIVE SUMMARY

INTRODUCTION

Contrarians Capital Holdings (Pty) Ltd (Hereafter referred to as CCH) appointed CRRenewables (Pty) Ltd to manage the Basic Assessment (BA) process for the development of a new Steynsrus 10MW Photovoltaic (PV) Solar Energy Facility (SEF) and associated infrastructure.

The proposed PV site is located on farm Arbeid 2154 and Weltevrede 2151, north-west of the town of Steynsrus in the Free State Province, South Africa. The proposed SEF will include photovoltaic (PV) solar panels and associated infrastructure.

It is important to note that the project was initially proposed at 5MW capacity and was issued with an Environmental Authorisation (EA) in 2014. Unfortunately due to unforeseen circumstances the EA lapsed. This process serves to re-apply for such authorisation and applicable water use authorisations.

As it was mentioned above that EA was issued in 2014, it is also important to note that the Social Impact Assessment (SIA) was also done in 2013. The SIA was conducted by Tony Barbour and he compiled a specialist report. CRRenewables, as the appointed to manage the current project, appointed Beverley Monametsi Consulting (Pty) Ltd (hereafter referred to as BMC) to re-asses the mentioned specialist report. This is a re-assessed Steynsrus Social Impact Report. CRRenewables and BMC would like to acknowledge the work done by Tony Barbour and for the compilation of the report.

PROJECT DESCRIPTION

The components associated with Steynsrus SEF will include:

- Photovoltaic (PV) panels up to 5m high (tracking) with capacity of 10 MW.
- An on-site substation as part of the PV plant, and overhead power line that will tie into the existing power line on site (Oosthuizen Traction-Komspruit Traction) including the associated switching station which is located at the southern boundary of the site, or overhead power line that will tie into the existing power line on site (Oosthuizen Traction-Komspruit Traction) including the associated switching station which is located at the eastern boundary of the site, or alternatively construct a new power line (approximately 155m) to connect to the existing Steynsrus Rural 132kV Substation.
- Extension/upgrade of the existing Steynsrus Rural 132kV substation 1 and associated connection infrastructure associated with the substation and PV plant.
- Cabling between the project components, to be lain underground where practical.
- Mounting structures (either rammed steel piles or piles with pre-manufactured concrete footings to support the PV panels).
- Internal access roads.
- Fencing.

[1] The proposed project will connect via the existing Steynsrus Rural 132kV Substation as associated infrastructure /switchyard and into the existing power line (Oosthuizen Traction-Komspruit Traction). The existing Steynsrus Rural Substation and possible expansion has been studied in this basic assessment process to fully describe the project and point of Steynsrus Rural 132kV Substation may require and expansion or upgrade to accommodate the Steynsrus Solar Energy Facility, however, this will not trigger a listed activity in terms of GN 38 of NEMA as the expansion or upgrade will not exceed 275 kilovolts.

» Workshop area for maintenance, storage, offices and small modular water filtration or di-ionisation unit.
» Parking and water storage tanks.

Based on the information from other SEF projects the construction phase for 10MW (Steynsrus PV panels) SEF is expected to extend over a period of 12-24 months and create approximately 80 employment opportunities during construction phase. The operational phase may employ approximately 25 people full time for a period of up to 20 years. The capital expenditure on completion is anticipated to be in the region of R 500 million.

APPROACH TO THE STUDY

The approach to the SIA study is based on the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Social Impact Assessment (February 2007). These guidelines are based on international best practice. The key activities in the SIA process embodied in the guidelines include:

- Describing and obtaining an understanding of the proposed intervention (type, scale, location), the communities likely to be affected and determining the need and scope of the SIA;
- Collecting baseline data on the current social environment and historical social trends
- Identifying and collecting data on the Social Impact Assessment variables and social change processes related to the proposed intervention. This requires consultation with affected individuals and communities;
- Assessing and documenting the significance of social impacts associated with the proposed intervention; and
- Identifying alternatives and mitigation measures.

In this regard the study involved:

- Review of demographic data from the 2011 Census Survey and 2016 Community Survey;
- Review of relevant planning and policy frameworks for the area;
- Site specific information collected during the site visit to the area and interviews with key stakeholders;
- Review of information from similar projects in South Africa; and
- Identification of social issues associated with the proposed project.

SUMMARY OF KEY FINDINGS

The key findings of the study are summarised under the following sections:

- Fit with policy and planning;
- Construction phase impacts;
- Operational phase impacts;
- Cumulative Impacts;
- Decommissioning phase impacts;

- No-development option.

Fit with planning

The key documents reviewed included:

- The National Energy Act (2008);
- The White Paper on the Energy Policy of the Republic of South Africa (December 1998);
- The White Paper on Renewable Energy (November 2003);
- Integrated Resource Plan (IRP) for South Africa (2019);
- Free State Provincial Growth and Development Strategy (2013); and
- Moqhaka Local Municipality Integrated Development Plan (2017-2022).

The findings of the review indicated that renewable energy is strongly supported at a national, provincial, and local level. Based on this is it reasonable to conclude that the establishment of the proposed 10MW Steynsrus SEF is supported.

Construction phase

The key social issues associated with the construction phase include:

Potential positive impacts

Creation of employment and business opportunities, and the opportunity for skills development and on-site training.

The construction phase is expected to extend over a period of 12-24 months and create approximately 80 employment opportunities. It is anticipated that approximately 60 % (48) of the employment opportunities will be available to low skilled (construction labourers, security staff etc.), 25% (20) to semi-skilled workers (drivers, equipment operators etc.) and 15% (12) to skilled personnel (engineers, land surveyors, project managers etc.). The majority of the low-skilled employment opportunities associated with construction phase are, therefore, likely to be available to members from the local community. In this regard the majority of the beneficiaries are likely to be historically disadvantaged (HD) members of the community. The low education and skills levels in the area may however hamper potential opportunities for local communities. The majority of the skilled and semi-skilled opportunities are likely to be associated with the contactors appointed to construct the facility and associated infrastructure.

The total wage bill for the construction phase will be in the region of R 12 million. The injection of income into the area in the form of wages and rental for accommodation will create opportunities for local businesses in Steynsrus, Kroonstad and Bethlehem. The sector of the local economy that is most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport and security, etc. associated with the construction phase. The benefits to the local economy will be confined to the construction period (12-24 months).

The implementation of the proposed enhancement measures listed in the report would enable the establishment of the proposed solar park to support co-operation between the public and private sectors in order for the economic development potential of the Free State to be realised. In this regard the FSPGDS highlights the importance of enterprise development, and notes that the current levels of private sector development and investment in the province are low. The proposed solar park therefore has the potential to create opportunities to promote private sector investment and the development of SMMEs in the Free State Province. However, due to the relatively small scale of the project, these opportunities are likely to be limited.

The capital expenditure on completion is anticipated to be in the region of R 500 million. However, given the technical nature of the project and high import content associated with solar energy projects the potential opportunities for the MLM economy will be limited. However, opportunities are likely to exist for local contractors and engineering companies in Kroonstad, Bethlehem and Winburg.

Potential negative impacts

- Influx of construction workers employed on the project;
- Increased risk of stock theft, poaching and damage to farm infrastructure associated with construction workers;
- Increased risk of veld fires associated with construction related activities;
- Impact of heavy vehicles, including damage to roads, safety, noise and dust;
- Loss of agricultural land associated with construction related activities.

The significance of the potential negative impacts with mitigation was assessed to be of Low significance. The majority of the potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. However, the impact on individuals who are directly impacted on by construction workers and or job seekers (i.e. contract HIV/ AIDS) was assessed to be of Medium-High negative significance. In addition, due to the low population density of the area and the relatively small size of the labour force (80) the potential risk to local family structures and social networks is regarded as low. Table 1 summarises the significance of the impacts associated with the construction phase.

Table 1: Summary of social impacts during construction phase

Impact	**Significance No Mitigation**	**Significance With Mitigation**
Creation of employment and business opportunities	Low (Positive impact)	Medium (Positive impact)
Presence of construction workers and potential impacts on family structures and social networks	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)

Risk of stock theft, poaching and damage to farm infrastructure	Medium (Negative impact)	Low (Negative impact)
Risk of veld fires	Medium (Negative impact)	Low (Negative impact)
Impact of heavy vehicles	Low	Low
and construction activities	(Negative impact)	(Negative impact)
Loss of farmland	Medium (Negative impact)	Low (Negative impact)

Operational phase

The key social issues affecting the operational phase include:

Potential positive impacts
- Creation of employment and business opportunities. The operational phase will also create opportunities for skills development and training;
- Benefits associated with the establishment of a community trust.
- The establishment of infrastructure to generate renewable energy.

The total number of permanent employment opportunities is estimated to be in the region of 25. Of this total approximately 80% will be low and medium-skilled and 20% high skilled positions. The majority of the beneficiaries are therefore likely to be historically disadvantaged (HD) members of the community. Over time it will also be possible to increase the number of local employment opportunities through the implementation of a skills development and training programme linked to the operational phase. Such a programme would support the strategic goals of promoting local employment and skills development contained in the MLM IDP and the FSPGDP.

The establishment of a Community Trust also creates an opportunity to support local economic development in the area. Community Trusts provide an opportunity to generate a steady revenue stream that is guaranteed for a 20 year period. The revenue from the proposed solar plant will be used to support a number of social and economic initiatives in the area, including:
- Creation of jobs;
- Education;
- Support for and provision of basic services;
- School feeding schemes;
- Training and skills development;
- Support for SMME's.

The long term duration of the revenue stream associated with a solar plant linked Community Trust also enables local municipalities and communities to undertake long term planning for the area. Experience has however also shown that Community Trusts can be mismanaged. This issue will need to be addressed in order to maximise the potential benefits associated with the establishment of a Community Trust.

The proposed development also represents an investment in infrastructure for the generation of clean, renewable energy, which, given the challenges created by climate change, represents a positive social benefit for society as a whole.

Potential negative impacts

- The visual impacts and associated impact on sense of place and the landscape;
- Impact on tourism.

The visual impacts on landscape character associated with large renewable energy facilities, such as solar thermal plants, are highlighted in the research undertaken by Warren and Birnie (2009). In the South African context, the majority of South Africans have a strong connection with and affinity for the large, undisturbed open spaces that are characteristic of the South African landscape. The impact of solar energy plants on the landscape is therefore likely to be a key issue in South Africa, specifically given South African's strong attachment to the land and the growing number of solar energy applications. The visual impacts associated with the proposed Steynsrus 10MW PV SEF are, however, likely to be low due to the existing power lines in the area and its relatively small size. The significance of the impacts associated with the operational phase are summarised in Table 2.

Table 2: Summary of social impacts during operational phase

Impact	**Significance No Mitigation**	**Significance With Mitigation**
Creation of employment and business opportunities	Low (Positive impact)	Medium (Positive impact)
Benefits associated with the establishment of a community trust	Medium (Positive impact)	Medium (Positive impact)
Establishment of infrastructure for the generation of renewable energy	Medium (Positive impact)	Medium (Positive impact)
Visual impact and impact on sense of place	Medium (Negative impact)	Low (Negative impact)
Impact on tourism	Low (Positive and Negative)	Low (Positive and Negative)

Cumulative Impacts

The cumulative impacts associated with solar energy facilities, such as the proposed Steynsrus SEF are largely linked to the impact on sense of place and visual impacts. In the case of the proposed Steynsrus SEF the visual character of the area has been impacted by two existing power lines and the Steynrus substation. The significance of the potential cumulative social impacts, specifically the impact on the landscape, was rated to be low.

However, it is recommended that the environmental authorities consider the overall cumulative impact on the rural character and the area's sense of place before a final decision is taken with regard to the optimal number of solar energy facilities in the area. In addition, the siting and number of individual components of the plant should be informed by findings of the relevant VIAs, specifically with respect to the visual impact on farmsteads and important roads in the area.

Transmission lines

The findings of the SIA indicate that the impacts associated with the proposed overhead power line will be low.

No-Development Option

The No-Development option would represent a lost opportunity for South Africa to supplement its current energy needs with clean, renewable energy. Given South Africa's position as one of the highest per capita producers of carbon emissions in the world, this option would represent a High negative social cost.

The no-development option also represents a lost opportunity in terms of the employment and business opportunities (construction and operational phase) associated with the proposed solar park and the benefits associated with the establishment of a Community Trust. This also represents a negative social cost.

Decommissioning phase

Due to the relatively small number of people affected (~25) the social impacts associated with the decommissioning of the facility are likely to be low. In addition, the potential impacts can be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are assessed to be Low (negative).

The option of establishing an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas, should be investigated.. The Trust Fund should be funded by a percentage of the revenue generated from the sale of energy to the national grid over the 20 year operational life of the facility. The rationale for the establishment of a Rehabilitation Trust Fund is linked to the experiences with the mining sector in South Africa and failure of many mining companies to allocate sufficient funds during the operational phase to cover the costs of rehabilitation and closure.

CONCLUSIONS AND RECOMMENDATIONS

The findings of the SIA indicate that the development of the proposed 10 MW Steynsrus SEF will create employment and business opportunities for locals during both the construction and operational phase of the project. The establishment of a Community Trust funded by revenue generated from the sale of energy will also create an opportunity to support local economic development in the area. This represents a social benefit for an area where there are limited opportunities.

The proposed development also represents an investment in clean, renewable energy infrastructure, which, given the challenges created by climate change, represents a positive social benefit for society as a whole. The establishment of the proposed Steynsrus SEF is therefore supported by the findings of the SIA.

IMPACT STATEMENT

The findings of the SIA undertaken for the proposed 10 MW each Steynsrus SEF indicate that the potential social benefits associated with the project outweigh the potential negative social impacts. The establishment of a Community Trust also creates an opportunity to support local economic development in the area. The proposed development also represents an investment in clean, renewable energy infrastructure, which, given the challenges created by climate change, represents a positive social benefit for society as a whole.

It is therefore recommended that the 10 MW Steynsrus SEF as proposed be supported, subject to the implementation of the recommended mitigation measures and management actions contained in the report.

TABLE OF CONTENTS

ACRONYMS

DEA&DP	Department of Environmental Affairs and Development Planning (Western Cape)
DM	District Municipality
DoE	Department of Energy

EIA	Environmental Impact Assessment
FSPGDS	Free State Provincial Growth and Development Strategy
GDPR	Gross Domestic Product of the Region
HDI	Human Development Index
IDP	Integrated Development Plan
IPP	Independent Power Producer
IRP	Integrated Resource Plan
kV	Kilovolts
LED	Local Economic Development
LM	Local Municipality
MW	Megawatt
MLM	Moqhaka Local Municipality
PGDS	Provincial Growth and Development Strategy
PV	Photovoltaic
SEF	Photovoltaic solar energy facility
RBS	Revised Balanced Scenario
SDF	Spatial Development Framework
SIA	Social Impact Assessment

SECTION 1: INTRODUCTION

1.1 INTRODUCTION

Contrarians Capital Holdings (Pty) Ltd (Hereafter referred to as CCH) appointed CRRenewables (Pty) Ltd to manage the Basic Assessment (BA) process for the development of a new Steynsrus 10MW Photovoltaic (PV) Solar Energy Facility (SEF) and associated infrastructure.

The proposed PV site is located on farm Arbeid 2154 and Weltevrede 2151, north-west of the town of Steynsrus in the Free State Province, South Africa (see figure 1.1 below). The proposed SEF will include photovoltaic (PV) solar panels and associated infrastructure.

It is important to note that the project was initially proposed at 5MW capacity and was issued with an Environmental Authorisation (EA) in 2014. Unfortunately due to unforeseen circumstances the EA lapsed. This process serves to re-apply for such authorisation and applicable water use authorisations.

As it was mentioned above that EA was issued in 2014, it is also important to note that the Social Impact Assessment (SIA) was also done in 2013. The SIA was conducted by Tony Barbour and he compiled a specialist report. CRRenewables, as the appointed to manage the current project, appointed Beverley Monametsi Consulting (Pty) Ltd (hereafter referred to as BMC) to review the mentioned specialist report. This is a reviewed Steynsrus Social Impact Report. CCRenewables and BMC would like to acknowledge the work done by Tony Barbour and for the compilation of the report.

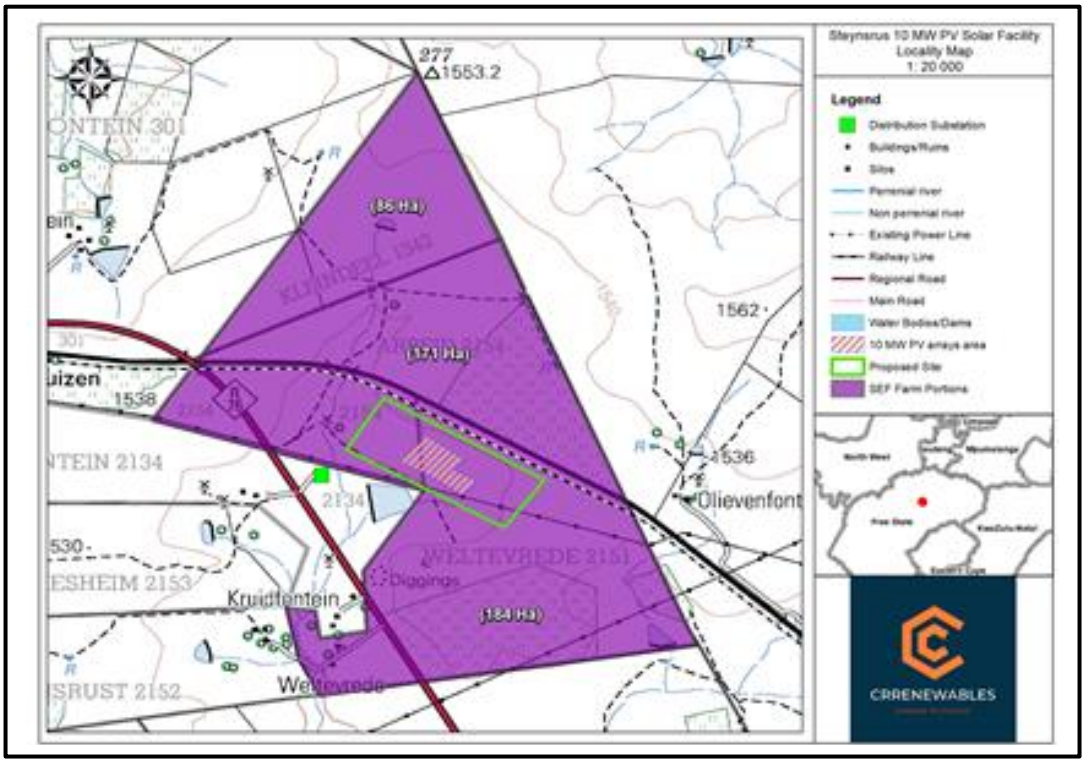


Figure 1.1: Steynsrus 10MW PV Solar Facility Locality Map

1.2 TERMS OF REFERENCE

The terms of reference for the SIA require:

- A description of the environment that may be affected by the activity and the manner in which the environment may be affected by the proposed facility
- A description and assessment of the potential social issues associated with the proposed facility
- Identification of enhancement and mitigation aimed at maximising opportunities and avoiding and or reducing negative impacts

1.3 PROJECT DESCRIPTION

The proposed Steynsrus Solar Energy Facility (SEF) will have an installed capacity of 10MW. The energy will be linked via an on-site substation to the Eskom grid. The project is therefore an Independent Power Producer (IPP) project.

Photovoltaic technology uses the energy from the sun to generate electricity through a process known as the Photovoltaic Effect. Simply speaking, this refers to light knocking electrons into a higher state of energy to create electricity, best illustrated by the small photovoltaic cell on hand held solar calculators. A photovoltaic array typically consists of the following components (See Figure 1.2):

Photovoltaic Cells
A photovoltaic (PV) cell can consist of a thin film technology or polycrystalline silicone cell which acts as a semiconductor used to produce the photovoltaic effect. Individual PV cells are linked and placed behind a protective glass sheet to form a photovoltaic panel. Other technologies that can be used include thin film.

Inverter
The photovoltaic effect produces electricity in direct current. However, in order to transmit this power within the Eskom grid it must be converted to alternating current which requires an inverter.

Support Structure
The PV panels will be attached to a support structure approximately 3.4 meters off the ground set at an angle so to receive the maximum amount of solar radiation. The angle of the panel is dependent on the latitude of the proposed facility and the angles may be adjusted to optimise for summer or winter solar radiation characteristics.

The PV panels are designed to operate continuously for more than 20 years, unattended and with low maintenance.

Figure 1.2: Ground mounted solar panel

- The PV Solar Energy Facility will consists of tracking PV technology (see Figure 1.3 below) and is located on two properties, namely Weltevrede 2151 and Arbeid 2154.

Figure 1.3: Illustration of a tracking solar energy facility (Courtesy of Amonix™)

The location of Steynrus PV Solar Facility is illustrated in Figure 1.4. The components associated with Steynsrus SEF will include:

» Photovoltaic (PV) panels up to 5m high (tracking) with a capacity of up to 10MW.
» An on-site substation as part of the PV plant, and overhead power line that will tie into the existing power line on site (Oosthuizen Traction-Komspruit Traction) including the associated switching station which is located at the southern boundary of the site, or overhead power line that will tie into the existing power line on site (Oosthuizen Traction-Komspruit Traction) including the associated switching station which is located at the eastern boundary of the site, or alternatively construct a new power line (approximately 155m) to connect to the existing Steynsrus Rural 132 kV Substation.
» Extension/upgrade of the existing Steynsrus Rural 132kV substation2 and associated connection infrastructure associated with the substation and PV plant.
» Cabling between the project components, to be lain underground where practical.
» Mounting structures (either rammed steel piles or piles with pre-manufactured concrete footings to support the PV panels).
» Internal access roads.

» Fencing.
» Workshop area for maintenance, storage, offices and small modular water filtration or di-ionisation unit.
» Parking and water storage tanks.

Steynsrus PV Solar Energy Facility is located on two properties, namely Weltevrede 2151 and Arbeid 2154. In total, the properties on which the proposed activity is to be undertaken constitute approximately 357ha, while the proposed activity is to be undertaken on approximately 30ha of the landholdings. Based on the information from other SEF projects the construction phase for a 10 MW SEF is expected to extend over a period of 12-18 months and create approximately 80 employment opportunities. The operational phase will employ approximately 25 people full time for a period of up to 20 years. The capital expenditure on completion is anticipated to be in the region of R 500 million for a 10 MW. See figure 1.4 for Steynsrus PV Solar energy facility.

Figure 1.4: Location of Steynsrus PV Solar Energy Facility

[2] The proposed project will connect via the existing Steynsrus Rural 132kV Substation as associated infrastructure /switchyard and into the existing power line (Oosthuizen Traction-Komspruit Traction). The existing Steynsrus Rural Substation and possible expansion has been studied in this basic assessment process to fully describe the project and point of Steynsrus Rural 132kV Substation may require and expansion or upgrade to accommodate the Steynsrus Solar Energy Facility, however, this will not trigger a listed activity in terms of GN 38 of NEMA as the expansion or upgrade will not exceed 275 kilovolts.

1.4 APPROACH TO STUDY

The approach to the SIA study is based on the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Social Impact Assessment (February 2007). These guidelines are based on international best practice. The key activities in the SIA process embodied in the guidelines include:

- Describing and obtaining an understanding of the proposed intervention (type, scale, location), the settlements and communities likely to be affected by the proposed project
- Collecting baseline data on the current social and economic environment;
- Identifying the key potential social issues associated with the proposed project. This involved a site visit to the area and consultation with affected individuals and communities;
- Assessing and documenting the significance of social impacts associated with the proposed intervention
- Identifying alternatives and mitigation measures

In this regard the study involved:

- Review of demographic data from the 2011 Census Survey and 2016 Community Survey;
- Review of relevant planning and policy frameworks for the area;
- Review of information from similar studies in South Africa, including the EIAs undertaken for other renewable energy projects, including wind energy facilities;
- Site visit and interviews with key stakeholders;
- Identification and assessment of the social issues associated with the proposed project.

Annex A contains a list of stakeholders interviewed and secondary information reviewed. Annex B summarises the assessment methodology used to assign significance ratings to the assessment process.

1.4.1 Definition of social impacts

Social impacts can be defined as "The consequences to human populations of any public or private actions (these include policies, programmes, plans and/or projects) that alter the ways in which people live, work, play, relate to one another, organise to meet their needs and generally live and cope as members of society. These impacts are felt at various levels, including individual level, family or household level, community, organisation or society level. Some social impacts are felt by the body as a physical reality, while other social impacts are perceptual or emotional" (Vanclay, 2002).

When considering social impacts it is important to recognise that social change is a natural and on-going process (Burdge, 1995). However, it is also important to recognise and understand that policies, plans, programmes, and/or projects implemented by government departments and/or private institutions have the potential to influence and alter both the ***rate*** and ***direction*** of social change. Many social impacts are not in themselves "impacts" but change process that may lead to social impacts (Vanclay, 2002). For example the influx of temporary construction workers is in itself not a social impact. However, their presence can result in range of social impacts, such as increase

in antisocial behaviour. The approach adopted by Vanclay stresses the importance of understanding the processes that can result in social impacts. It is therefore critical for social assessment specialists to think through the complex causal mechanisms that produce social impacts. By following impact pathways, or causal chains, and specifically, by thinking about interactions that are likely to be caused, the full range of impacts can be identified (Vanclay, 2002).

An SIA should therefore enable the authorities, project proponents, individuals, communities, and organisations to understand and be in a position to identify and anticipate the potential social consequences of the implementation of a proposed policy, programme, plan, or project. The SIA process should alert communities and individuals to the proposed project and possible social impacts, while at the same time allowing them to assess the implications and identify potential alternatives. The assessment process should also alert proponents and planners to the likelihood and nature of social impacts and enable them to anticipate and predict these impacts in advance so that the findings and recommendations of the assessment are incorporated into and inform the planning and decision-making process.

However, the issue of social impacts is complicated by the way in which different people from different cultural, ethic, religious, gender, and educational backgrounds etc view the world. This is referred to as the "social construct of reality". The social construct of reality informs people's worldview and the way in which they react to changes.

1.4.2 Timing of social impacts

Social impacts vary in both time and space. In terms of timing, all projects and policies go through a series of phases, usually starting with initial planning, followed by implementation (construction), operation, and finally closure (decommissioning). The activities, and hence the type and duration of the social impacts associated with each of these phases are likely to differ.

1.5 ASSUMPTIONS AND LIMITATIONS

1.5.1 Assumptions

Strategic importance of the project and no-go option
It is assumed that the strategic importance of promoting renewable energy, including solar energy, is supported by the national and provincial energy policies.

Technical suitability
It is assumed that the development site identified by CCH represents a technically suitable site for the establishment of a solar energy plant.

Fit with planning and policy requirements
Legislation and policies reflect societal norms and values. The legislative and policy context therefore plays an important role in identifying and assessing the potential social impacts associated with a proposed development. In this regard a key component of the SIA process is to assess the proposed development in terms of its fit with key planning and policy documents. As such, if the findings of the study indicate that the proposed development in its current format does not conform to the spatial principles and

guidelines contained in the relevant legislation and planning documents, and there are no significant or unique opportunities created by the development, the development cannot be supported.

However, the study recognises the strategic importance of solar energy and the technical, spatial and land use constraints required for such facilities.

1.5.2 Limitations

Interviews
Due to the timing of the site visit in December none of the local municipal officials and adjacent landowners were available at the time that the site visit was conducted.

1.6 SPECIALIST DETAILS

The lead author of this report is an independent specialist with 15 years' experience in the field of Environmental Management. Her qualifications include a BSc, B Sc (Hons) and an MSc in Water Resource Management. In terms of SIA experience, Beverley Monametsi has 5 years' experience in the field of Environmental Impact Assessment.

1.7 DECLARATION OF INDEPENDENCE

This confirms that Beverley Monametsi, the specialist consultant responsible for reviewing the study and the SIA Report, is independent and do not have vested or financial interests in proposed SEF being either approved or rejected.

1.8 REPORT STRUCTURE

The report is divided into five sections, namely:

- Section 1: Introduction
- Section 2: Summary of key policy and planning documents relating to solar energy and the area in question
- Section 3: Overview of the study area
- Section 4: Identification and assessment of key social issues
- Section 5: Summary of key findings and recommendations

SECTION 2: POLICY AND PLANNING ENVIRONMENT

2.1 INTRODUCTION

Legislation and policy embody and reflect key societal norms, values and developmental goals. The legislative and policy context therefore plays an important role in identifying, assessing and evaluating the significance of potential social impacts associated with any given proposed development. An assessment of the "policy and planning fit[1]" of the proposed development therefore constitutes a key aspect of the Social Impact Assessment (SIA). In this regard, assessment of "planning fit" conforms to international best practice for conducting SIAs.

Section 2 provides an overview of the policy and planning environment affecting the proposed Steynsrus Solar Energy Facility. For the purposes of the meeting the objectives of the SIA the following policy and planning documents were reviewed, namely:

- The National Energy Act (2008);
- The White Paper on the Energy Policy of the Republic of South Africa (December 1998);
- The White Paper on Renewable Energy (November 2003);
- Integrated Resource Plan (IRP) for South Africa (2019)
- Free State Growth and Development Strategy (2013)
- Moqhaka Local Municipality Integrated Development Plan (2017-2022).

2.2 NATIONAL LEVEL ENERGY POLICY

2.2.1 National Energy Act (Act No 34 of 2008)

The National Energy Act was promulgated in 2008 (Act No 34 of 2008). One of the objectives of the Act was to promote diversity of supply of energy and its sources. In this regard, the preamble makes direct reference to renewable resources, including solar:

"To ensure that diverse energy resources are available, in sustainable quantities, and at affordable prices, to the South African economy, in support of economic growth and poverty alleviation, taking into account environmental management requirements (…); to provide for (…) increased generation and consumption of renewable energies…" (Preamble).

[1] Planning fit" can simply be described as the extent to which any relevant development satisfies the core criteria of appropriateness, need, and desirability, as defined or circumscribed by the relevant applicable legislation and policy documents at a given time.

2.2.2 White Paper on the Energy Policy of the Republic of South Africa

Investment in renewable energy initiatives, such as the proposed Solar Park, is supported by the White Paper on Energy Policy for South Africa (December1998). In this regard the document notes:

"Government policy is based on an understanding that renewables are energy sources in their own right, are not limited to small-scale and remote applications, and have significant medium and long-term commercial potential".

"Renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future".

The support for renewable energy policy is guided by a rationale that South Africa has a very attractive range of renewable resources, particularly ***solar*** and wind and that renewable applications are in fact the least cost energy service in many cases; more so when social and environmental costs are taken into account.

Government policy on renewable energy is thus concerned with meeting the following challenges:

- Ensuring that economically feasible technologies and applications are implemented;
- Ensuring that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options; and,
- Addressing constraints on the development of the renewable industry.

The White Paper also acknowledges that South Africa has neglected the development and implementation of renewable energy applications, despite the fact that the country's renewable energy resource base is extensive and many appropriate applications exist.

The White Paper also notes that renewable energy applications have specific characteristics that need to be considered. Advantages include:

- Minimal environmental impacts in operation in comparison with traditional supply technologies; and
- Generally lower running costs, and high labour intensities.

Disadvantages include:

- Higher capital costs in some cases;
- Lower energy densities; and
- Lower levels of availability, depending on specific conditions, especially with sun and wind based systems.

2.2.3 White Paper on Renewable Energy

This White Paper on Renewable Energy (November, 2003) (further referred to as the White Paper) supplements the *White Paper on Energy Policy*, which recognizes that the medium and long-term potential of renewable energy is significant. This Paper sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa.

The White Paper notes that while South Africa is well-endowed with renewable energy resources that have the potential to become sustainable alternatives to fossil fuels, these have thus far remained largely untapped. As signatory to the Kyoto Protocol [2] ,, Government is determined to make good the country's commitment to reducing greenhouse gas emissions. To this purpose, Government has committed itself to the development of a framework in which a national renewable energy framework can be established and operate.

South Africa is also a signatory of the Copenhagen Accord, a document that delegates at the 15th session of the Conference of Parties (COP 15) to the United Nations Framework Convention on Climate Change agreed to "take note of" at the final plenary on 18 December 2009. The accord endorses the continuation of the Kyoto Protocol and confirms that climate change is one of the greatest challenges facing the world. In terms of the accord South Africa committed itself to a reduction target of 34% compared to business as usual.

Apart from the reduction of greenhouse gas emissions, the promotion of renewable energy sources is aimed at ensuring energy security through the diversification of supply (in this regard, also refer to the objectives of the National Energy Act).

Government's long-term goal is the establishment of a renewable energy industry producing modern energy carriers that will offer in future years a sustainable, fully nonsubsidised alternative to fossil fuels. The medium-term (10-year) target set in the White Paper is:

10 000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro. The renewable energy is to be utilised for power generation and non-electric technologies such as solar water heating and bio-fuels. This is approximately 4% (1667 MW) of the projected electricity demand for 2013 (41539 MW) (Executive Summary, ix).

[2] The **Kyoto Protocol** is a protocol to the United Nations Framework Convention on Climate Change (UNFCCC), aimed at fighting global warming. The UNFCCC is an international environmental treaty with the goal of achieving "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."[The Protocol was initially adopted on 11 December 1997 in Kyoto, Japan and entered into force on 16 February 2005. As of November 2009, 187 states have signed and ratified the protocol (Wikipedia)

2.2.4 National Integrated Resource Plan for Electricity (2019)

South Africa's National Development Plan (NDP) 2030 offers a long-term plan for the country. It defines a desired destination where inequality and unemployment are reduced and poverty is eliminated so that all South Africans can attain a decent standard of living. Electricity is one of the core elements of a decent standard of living. The NDP envisages that, by 2030, South Africa will have an energy sector that provides reliable and efficient energy service at competitive rates; that is socially equitable through expanded access to energy at affordable tariffs; and that is environmentally sustainable through reduced emissions and pollution. In formulating its vision for the energy sector, the NDP took as a point of departure the Integrated Resource Plan (IRP) 2010–2030 promulgated in March 2011.

The promulgated IRP 2010–2030 identified the preferred generation technology required to meet expected demand growth up to 2030. It incorporated government objectives such as affordable electricity, reduced greenhouse gas (GHG) emissions, reduced water consumption, diversified electricity generation sources, localisation and regional development

Following the promulgation of the IRP 2010–2030, implementation followed in line with Ministerial Determinations issued under Section 34 of the Electricity Regulation (Act No. 4) of 2006. The Ministerial Determinations give effect to planned infrastructure by facilitating the procurement of the required electricity capacity. Since the promulgated IRP 2010–2030, the capacity developments have taken place

Besides capacity additions, a number of assumptions have changed since the promulgation of IRP 2010–2030. Key assumptions that changed include the electricity demand projection, Eskom's existing plant performance, as well as new technology costs. These changes necessitated the review and update of the IRP which resulted in the Table 2.1 below:

Table 2.1 Proposed Updated Plan for the Period Ending 2030
Source: Integrated Resource Plan (IRP) for South Africa (2019)

	Coal	Nuclear	Hydro	Storage (Pumped Storage)	PV	Wind	CSP	Gas / Diesel	Other (CoGen, Biomass, Landfill)	Embedded Generation
2018	39 126	1 860	2 196	2 912	1 474	1 980	300	3 830	499	Unknown
2019	2 155					244	300			200
2020	1 433				114	300				200
2021	1 433				300	818				200
2022	711				400					200
2023	500									200
2024	500									200
2025					670	200				200
2026					1 000	1 500		2 250		200
2027					1 000	1 600		1 200		200
2028					1 000	1 600		1 800		200
2029					1 000	1 600		2 850		200
2030			2 500		1 000	1 600				200
TOTAL INSTALLED	33 847	1 860	4 696	2 912	7 958	11 442	600	11 930	499	2600
Installed Capacity Mix (%)	44.6	2.5	6.2	3.8	10.5	15.1	0.9	15.7	0.7	

Installed Capacity
Committed / Already Contracted Capacity
New Additional Capacity (IRP Update)

The following must be noted with regard to the plan in Table 2.1 above:

- Coal Installed Capacity is less the 12 000 MW capacity to be decommissioned between years 2020 and 2030
- Existing and committed Coal, Nuclear, Hydro and Pumped Storage Capacity is less auxiliary power. Stated numbers are therefore based on sent out capacity not rated capacity.
- Two additional units at Medupi have since been commissioned earlier than previously assumed.
- Distributed generation for own use installed base is unknown as these installations were exempted from holding a generation license or were not required to be registered
- The timing of new additional capacity as indicated in Table 2.1 above can change (move back or forward) depending on what happens with the projected electricity demand and or Eskom's existing plant performance

2.3 PROVINCIAL AND LOCAL LEVEL POLICY AND PLANNING

2.3.1 Free State Growth and Development Strategy(FSGDS)

The FSGDS puts forward a daring inclusive growth and development agenda for the Free State province. It unravels the provincial growth and development challenges, needs and opportunities towards 2030. Underlying the FSGDS are thus the success, challenges and opportunities that simultaneously continue to characterise the evolving provincial development landscape amid a wave of rapidly changing domestic and global events.

The FSGDS is an important instrument to shape and coordinate the allocation of resources across a wide government and societal spectrum based on the provincial development needs and priorities. It impels both the provincial government and social partners to be focused and decisive; weigh up trade-offs and make choices in the face of competing demands; develop and implement consistent strategies and programmes; and ensure that their plans reflect a shared vision by all. The objectives of the FSGDS are thus the following:

- To serve an overarching planning instrument articulating the development agenda and providing strategic direction for the province.
- To build uniformity of application of planning processes and methodologies.
- To formulate development plans and priorities for the province.
- To ensure inclusivity of planning processes
- To make effective use of scarce resources within the province by searching for more costeffective and sustainable solutions, whilst addressing the real causes of development challenges instead of merely the symptoms.
- To facilitate the speedy delivery of government programmes and plans.
- To identify opportunities for investment and provide an environment of certainty and predictability critical for investment.
- To provide a common vision and act as the basis for common action amongst all social partners, both inside and outside government in a province.
- To serve as a framework for budgets, implementation, and performance management.
- To serve as a framework for provincial spatial development.
- To monitor the implementation of plans and evaluate the impact thereof against the government's developmental priorities

Underlying the FSGDS is the Free State Vision 2030 which conjures the future the people of the province want in 2030. The Free State Vision 2030 invokes the need for drastic transformation, collective responsibility, convergence and a profound sense of ownership in the inclusive growth and development landscape of the Free State towards 2030.

The implementation of the FSGDS is informed by its vision 2030 which is: *By 2030, the Free State shall have a resilient, thriving and competitive economy that is inclusive, with immense prospects for human development anchored on the principles of unity, dignity, diversity, equality and prosperity for all. A critical goal in achieving these ideals is the creation of decent work.* Decent work is the most powerful way in which the dignity of the majority of the people can be restored and the benefits of economic growth and development can be shared.

Impelled by this Vision, the Free State of 2030 will be characterised by an economy that encourages the development of new growth sectors with emphasis on the knowledge based industries and the green economy.

The ultimate goal of economic success in 2030 will be to improve the living conditions of the people of the province, whilst at the same time addressing the legacy of apartheid and colonialism.

In our quest for inclusive economic growth and development, the environment will be protected for future generations. Lasting responses to climate change will be part of the landscape of the province. Steeped in democratic principles, government will be accountable, transparent, effective, efficient, and responsive to people's needs and corruption will be eliminated. Multiculturalism and non-racialism will be celebrated.

The following are pillars and high level targets that are meant to give practical meaning to the ideals contained in the Free State Vision 2030. Only targets that the Author thinks are relevant to the proposed Solar Park are identified below:

- Economic Restructuring, Growth and Employment Creation
    - Increase the provincial growth rate from 2.5% in 2011 to 7% in 2030; Increase the provincial contribution to the South African economy from 5% in 2010 to 15% in 2030; Reduce unemployment rate from 32% in 2012 (third quarter) to 6% by 2030
- Improved Quality of Life
    - Increase the proportion of households with access to electricity from 89.9% in 2011 to 100% in 2030; Reduce the housing informal settlement backlog from 23.4% in 2010 0% in 2030; Reduce the number of people living in poverty from 44.7% in 2010 to 0% in 2030
- Sustainable Rural Development
    - Increase the provision of quality basic services and invest in education, healthcare and public transport ; Improve access to markets for small-scale farmers and rural co-operatives

The FSGDS will, as a first step, priorities efforts to support employment creation in the following key sectors:
- Infrastructure;
- The agricultural value chain;
- The mining value chain;
- The green economy;
- Manufacturing sectors, which are included in IPAP 2; and
- Tourism and certain high-level services."

SMME development: The FSPGDS acknowledges the key role played by SMMEs in terms of economic development and job creation. To bolster economic growth and create employment opportunities, SMME development is high on the agenda of government.

Tourism: The emphasis in respect of tourism is to optimise its benefits. More specifically, the weekend tourism market for the north and north-eastern parts of the Province should be explicitly marketed. Emphasis is on nature tourism and heritage tourism.

Events tourism should be focused on in the larger urban areas of Bloemfontein and Welkom.

Human resource development and economic growth: Providing the skills for a growing economy will be done by means of the learnerships, providing skills through the FET sector and internships.

PV solar energy, therefore provides the Free State with an opportunity to diversify its economy in a way that is not affected by natural constraints such as low rainfall and limited water supplies.

2.3.2 Moqhaka Local Municipality (MLM) Integrated Development Plan (IDP) (2017-2022)

The IDP is a strategic development plan reviewed annually to guide all development in a municipal area and to inform municipal budgeting and allocation of resources as prescribed by the Municipal Systems Act, No 32 of 2000.

The vision of the MLM is to be a Municipality that creates an enabling environment for Socio economic growth and sustainable development.

The mission is to maintain and enhance quality of life by providing effective, efficient quality and affordable services equitably and facilitating facilitating sustainable socio economic growth through active community participation.".

The IDP identified the following as focus areas:

- Roads and Storm water
- Recreation & Sport
- Electricity
- Sanitation
- Water
- Job Creation
- Housing/Sites
- Safety & Security
- Refuse Removal
- Unhappiness expressed with Council/Service Delivery/Customer Care
- Parks and Cemeteries
- Education
- Health
- Fences and Fencing
- Social Security
- Control of Public Nuisances
- Fire, Traffic, Emergency Services & Law Enforcement
- Transport

The municipality has through its strategic planning and public participation processes ensured that the Municipal Strategic Priorities were unpacked by developing key

performance areas (KPAs), programmes, objectives, key performance indicators (KPIs) and targets for each of the KPAs and programmes

Priority areas for Basic Service Delivery include:

- Water
- Sanitation
- Roads and Storm Water
- Electricity and Energy
- Solid Waste Removal and Management

Strategic Objective 1 of the MLM is to Broaden Access and improve quality of municipal services.

The outcome for this objective is the sustainable delivery of improved services to all households. For the electricity priority area, the municipality strategy is to expand the electrification programme to any remaining areas and roll out solar energy in any identified areas at prescribes standards.

The construction and operation of the proposed Steynsrus SEF, can assist the MLM in meeting some of these priorities, specifically, the provision of electricity, establishment of community facilities and promotion of local economic development.

SECTION 3: OVERVIEW OF STUDY AREA

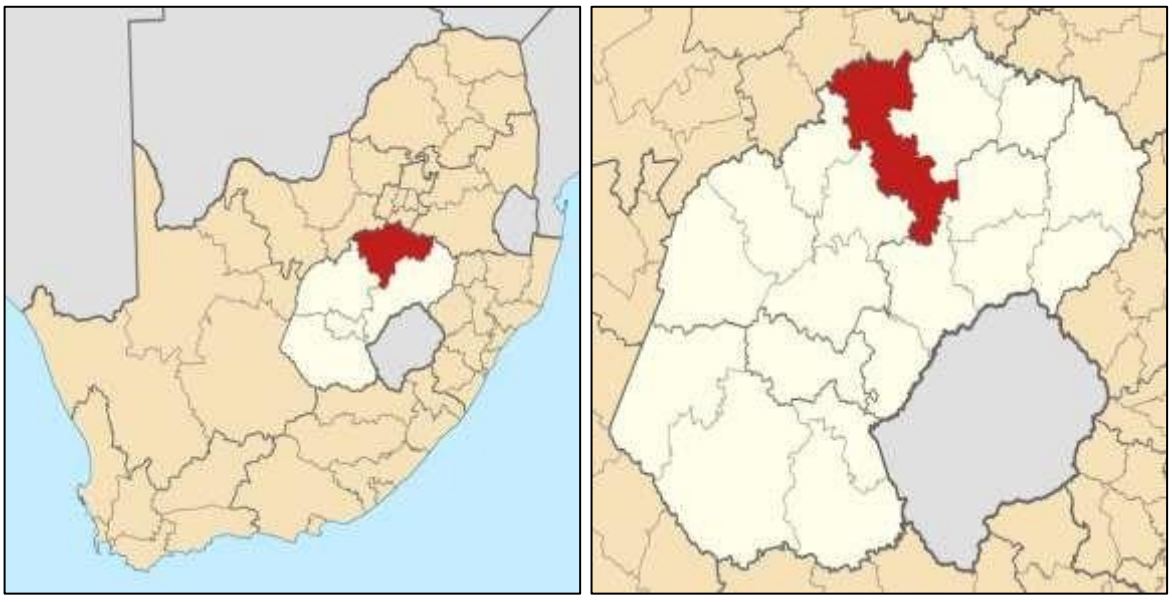
3.1 INTRODUCTION

Section 3 provides an overview of the study area with regard to:

- The relevant administrative context;
- The provincial and district level socio-economic context;
- The municipal level socio-economic context;
- Local, site specific context.

3.2 ADMINSTRATIVE CONTEXT

As indicated above, the proposed Steynsrus SEF is located ~ 4 km northwest of the town of Steynsrus, which is located within the Moqhaka Local Municipality (LM) of the Free State Province (Figure 1.3) approximately 45 km southeast of Kroonstad LM administrative centre) located adjacent to the N1 (between Bloemfontein and Johannesburg. According to the Moqhaka IDP, Steynsrus has a total population of ~13000 and is located ~ 240 km southeast of the City of Johannesburg and ~210km northwest of the Provincial capital of Bloemfontein.



Source: Wikipedia

Figure 3.1: The location of Fezile Dabi District Municipality (left) Moqhaka Local Municipality (right) within the Free State Province (cream)

3.3 PROVINCIAL CONTEXT

The proposed solar energy facility is located in the Free State Province which covers an area of 129 464 km^2, or 10.6% of the total land area of the country. The western part of the Free State is characterised by flat plains, pans, and undulating land. The south is primarily lowlands with hills. To the east the escarpment extends from Lesotho into low mountains and irregular undulating land with hills. The northern and central portions are marked by undulating land and hills. The climatic conditions range from moist and warm in the east to dry and warm in the west.

The Free State is one of the nine provinces of South Africa and is centrally located on the flat, boundless plains. It represents 10.6% of the total land area of the country. It boasts wide horizons, blue skies, mountains and goldfields. The province covers an area of 129 825 km2 and, in 2011, it had a population of 2 745 590 million.

The Free State province borders most of the other provinces, with the exceptions being Limpopo and the Western Cape. To the east, it has an international boundary with Lesotho nestling in the hollow of its beanlike shape, and the escarpment separates it from the Eastern Cape and KwaZulu-Natal. The Orange and Vaal rivers form the southern, western and most of the northern border and the last section of the north-eastern boundary is formed by the Klip River. The western part consists of plains, with pans as primary hydrological feature. The eastern part is mountainous. The Maluti Mountains along the border are connected to the Drakensberg on the border with KwaZulu-Natal. With four district municipalities and one metropolitan municipality, the province consists mainly of grasslands with some Karoo vegetation in the south.

The District Municipalities are Xhariep, Thabo Mofutsanyana, Fezile Dabi and Lejweleputswa District and Manguang Metropolitan Area (MMM).

The Mangaung Metropolitan Municipality contains the largest population, 747 431, and comprises mainly of open grassland, with mountains in the most eastern region. The main urban centre is Bloemfontein. The city is the trade and administrative hub of the Free State and boasts the provincial government and the seat of the Appeal Court of South Africa. It also has a rich history, which includes the establishment of the African National Congress in 1912 and the National Party in 1914.

The Xhariep District Municipality, with a total of 146 259 inhabitants is located in the south-west of the province. It is a semi-arid area with extensive farming, mainly sheep. The district comprises open grasslands with small wide dispersed towns. The Xhariep Dam is one of the tourists' attractions and offers a variety of leisure facilities.

The Thabo Mofutsanyana District Municipality borders Lesotho to the east and has beautiful hills and fruit farms. The district with a population of 736 238 inhabitants is one of the most important tourism destinations due to spectacular scenic beauty of the Drakensberg and Maluti mountain ranges. Other attractions include the Golden Gate Highland Park, the annual cherry festival at Ficksburg, a Basotho cultural village in Maluti-a-Phofung, and Khoisan rock paintings.

With a population of 627 626, the Lejweleputswa District Municipality boasts goldfields and it is a major agricultural area. The district forms part of the larger Witwatersrand basin. The first gold was discovered in the early 1940s. Bothaville is one of the

important maize centres in the country. The annual National Maize Production Organisation festival attracts more than 50 000 visitors and is the second largest private show in the world.

The Fezile Dabi District Municipality, with 488 036 people, is an important agricultural production area, mainly maize. The Vaal Dam is the main source of water and offers a wide variety of leisure facilities. Other attractions include the Vredefort Dome, which is the third largest meteorite site in the world and the San paintings. Sasolburg is the location of the country's largest chemical and synthetic fuel plant.

The Provincial Development Analysis

1. The Structure of the Economy Limits Job Creation

About 30 years ago, the primary sector contributed more than 50% to the provincial economy compared to the 13% in 2010. Whilst this trend is often interpreted as a sign of a maturing economy, it represents de-industrialisation. The industrial base of the provincial economy exhibits the features and vulnerabilities of the minerals-energycomplex. Mining was the mainstay of the provincial economy. Its contribution dropped from 16% of the provincial output in 1996 to 9% in 2010. This led to a decline in employment by the sector from 180 000 in 1980 to 33 000 in 2010.

The manufacturing sector makes up 14% of the provincial output. However, the petro-chemicals sector constitutes more than 85% of the economic output of manufacturing in the Free State. This sector is capital-intensive and energy-intensive. In the province, 71% of manufacturing employment is accounted for by activities that account for 22% of the sector's output. The petro-chemicals sector, which accounts for more than 85% of manufacturing output, accounts for 29% of the sector's employment. The manufacturing sector is thus concentrated in terms of ownership, production and geographical location. It is also disconnected from the rest of the provincial economy.

Another important sector is agriculture. This sector also experienced a relative decline. The contribution of agriculture dropped from 5.3% in 1996 to below 3.8% in 2010.
Employment in agriculture in the province and nationally has decreased. However, the decrease in the province has been marginal than that at national with about 20 000 jobs lost. It should be noted that agriculture has been significantly affected by liberalisation policies, which included the removal of subsidies to farmers and the reduction of import barriers. These processes not only led to increased concentration of production, but also rapid mechanisation in the large-scale commercial segments, which further limits the ability of the sector to absorb labour

2. Increasing Unemployment

Unemployment is the most serious problem confronting the economy. In the Free State, unemployment rate increased from 25.5% in the third quarter of 2011 to 32% in the third quarter of 2012, an increase of 6.5%. The youth and women were mostly affected by unemployment. The significant unemployment rate can mainly be attributed to the decline in mining combined with the limited industrial base in the province.

Economic sectors differ in terms of their inherent capacity to generate employment opportunities, with some sectors being more labour intensive than others. While mining,

agriculture and manufacturing lost a substantial number of formal jobs (about 200 000 over a fifteen-year period), community service, finance and trade gained in terms of employment. The most important sources of direct formal employment opportunities were agriculture, trade and community services, while the contribution of the household sector (with people working mainly as domestic workers) should not be ignored.

This increasing trend towards escalating unemployment is largely attributable to a huge loss of direct employment opportunities in mining and the dominance of the capitalintensive petro-chemicals sector in the province. It is also important to note that the level of employment is measured at the place and not at the origin of employment. In the case of the Free State, a large percentage of men working on the mines come from other provinces and Lesotho. Thus, the actual number of people employed in mining-related jobs is even lower than the official statistics suggest.

The provincial economic distribution in 2011 shows that agriculture was still the dominant sector and accounted for 10.3% of the provincial economy. It was followed by services sector at 10.1% and mining and quarry at 7.9%.

3. Inadequate Growth Performance

Figures in the table below suggest that the growth rate of the Free State has been below the national average. As a result, the contribution of the province to the national economy declined from 5.8% in 1996 to 5% in 2010. In 2011, Statistics South Africa (Stats SA) data shows that the real economic growth rate, at 2005 constant prices, was 2.5% in the Free State in comparison to 3.5% for the entire country. The annual growth rate of gross value added between 1996 and 2004 was 2.2% for the Free State against 3.3% for South Africa.3 However, this lower-than-average growth for the province should be seen against the considerable decline in mining. If one excludes mining from the equation at provincial and national levels, the average Gross Value Add (GVA) growth rate for the province is estimated at 2.7% per annum versus 3.5% at national level.

As can be expected mining and agriculture are the two sectors which have experienced negative economic growth since 1996. It should be mentioned that, to a large extent, agriculture has stagnated at the 1996 levels. What is noteworthy is that agriculture has grown significantly on a national scale, while having remained stagnant in the Free State. The decrease in the mining sector can be traced to a reduction in mining resources, an increase in deep mining and to negative shocks from the global economy.

4. Spatial Concentration of Economic Activity

The Free State spatial economy exhibits increasing levels of economic concentration. While Matjhabeng has lost its share of the province's economy due to mine downscaling Metsimaholo and Mangaung have increased their share of the province's economy. In 1996, these two municipalities contributed about 45% to the province's economy, compared to 55% in 2010. Together, these two municipalities have only approximately 35% of the province's population. If Matjhabeng, with its declining mining economy, is also taken into account, these three municipal areas contribute 70% to the Free State's economy. Mangaung, Metsimaholo and Moqhaka are the only three municipalities in which the GVA contribution to the Free State economy exceeds its population share of the province.

Metsimaholo is also the municipality with the largest economic growth rate of 4.6% per annum between 1996 and 2010. A growth rate of 6% per annum was also recorded for Metsimaholo for the period 2003–2010. Other municipal areas that have experienced moderate economic growth between 1996 and 2010 are: Mangaung (2.6% per annum); Letsemeng (3% per annum due to mining activities and high valued agricultural products); Moqhaka (2.1% per annum); and Kopanong (2.1% per annum – from a low basis). However Metsimaholo is dominated by the capital-intensive petro-chemical, while the other municipalities are unable to grow at rates that are required to absorb the labour force. The spatial concentration of economic activity in the province continues to perpetuate the economic exclusion of the majority of the people.

5. Under-Utilisation and Declining Infrastructure

Only half of South Africa's 20 000 kilometres of track is utilised, and some 35% of the nation's track carries no activity or very low activity. In addition 58% of South African roads are gravel. The Free State is no exception. In 2001, it was estimated that 2% of paved roads were in a very good condition while 6% in a good condition, 29% in a fair condition, 36% are in a poor condition and 27% are in a very poor condition. This situation has not changed considerably, based on 2005 data; 82% of the road network had not been resealed in the previous 12 years. In relation to gravel roads, only 25% are of acceptable norm of 50mm of gravel thickness. In general, the state of the road network has worsened.

On a national level, the contribution of the transport, communications and storage sector changed from 9.51% in 2002 to 10.03% in 2008, perhaps due to the increase in the wholesale and retail trade sectors.

The transport, communication and storage sector in the province contributed only 4.5% to that sector nationally in 2009. The sector's contribution to the provincial economy amounted to only 6.8% in 2009. This is a slight decline from the base of 7.5% in 2004. This decline is in contrast to the national contribution of transport which increased from 2001 to 2009.

The under-utilisation of infrastructure, especially rail, is connected to the decline in mining and the difficulties faced by the agricultural sector. This in turn led to disinvestment in rail. Generally, the backlogs in infrastructure are a result of the historic decline in public sector investment since the late 1970's. Major investments in water infrastructure for example, were last seen in the early 1980's. This has resulted in the dilapidation of water catchment areas and dysfunctional irrigation systems.

Notable however is the provision of basic infrastructure at a settlement level which has increased considerably. According to Stats SA 2011 Census figures, 97.8% of households in the Free State had access to piped water. Fezile Dabi had the highest number of household with Xhariep had access to piped water inside dwelling, 56.7%, followed by Lejweleputswa at 47.6%, Mangaung at 46.1%, Xhariep at 42.7% and Thabo Mofutsanyana at 33.6%. Notable increases have also been recorded for electricity access (from 74.4% in 2001 to 89.9% in 2011 for households with access to electricity for lighting in the

province). In the case of households with access to flush toilets, there was an increase from 46.3% in 2001 to 67% in 2011.

Despite these remarkable strides, there are still concerns. These include the availability of water (see section on environment), the quality of water and the overall management of water resources and water processes, together with the possible role of climate change. The Green Drop and Blue Drop reports suggest that the overall management and quality of water remain key obstacles to appropriate development while the age and quality of existing infrastructure is old and not good enough to sustain growth and development.

Another dimension that has to be considered is the disconnection between access and affordability. At a national level in 2006, 1.3 million households, which account for almost 5 million people, experienced water cut-offs due to non-payment. Overall, according to the 2010 General Household Survey by StatsSA, 2.3% of all households with electricity from the mains had their electricity shut off by the provider in the month before the survey because of non-payment. Just over 80% of households had electricity from the mains nationally. The shut offs affected 250 000 households, or around 1 million people. The main drivers of non-payment are affordability, low incomes and unemployment.

The bottom poorest 30% of the households experience more cut-offs. The factors that drive non-payment are relatively dominant in the Free State province, compared to national. This in turn provides an opportunity for social protests to be fomented.

6. Quality of Education, Skills Shortages and Mismatches

The educational profile shows laudable improvement in respect of particularly Grade 12 pass rates since the demise of apartheid. The Grade 12 pass rate in the province has increased from 75.7% in 2011 to 81.1% in 2012. Despite these attainments, as revealed by Stats SA 2011 Census, 7.1% of persons aged 20 years and above in the province had no schooling (Xhariep 12.9%, Lejweleputswa 6.8%, Thabo Mofutsanyana 9.1%, Fezile Dabi 7.3% and Mangaung 4.3%), 16.1% had some primary school education whilst 34.6% had some secondary education. Only 26.7% of persons aged 20 years and above had Grade 12 with a mere 9.8% having post Grade 12 qualifications.

The 2001 occupational profile of the province was such that 5% were professionals, 35% elementary, 12% crafts, 10% were plant and machine operators. The Free State has on average fewer people employed in the higher paid managerial and senior positions than the average for South Africa. The province has proportionally more people employed in the lower paid semi-skilled type and elementary occupations. The direct implication is that the workforce of the province seems to be occupying positions that in general, pay less than the average for South Africa.

Against this background, a number of supply-side concerns remain crucial. First, there are concerns about the ability of the system to support early childhood development. Second, the competencies of primary school learners in respect of literacy and numeracy are low. Third, the educational system is also hampered by the fact that a significant proportion of pupils leave secondary school before completing Grade 12. Of those passing Grade 12, a small portion continues with tertiary education. The percentages of learners who complete Grade 12 with university exemption, mathematics and physical science remain low.

These issues drive the structural unemployment problem both provincially and nationally. In this context, the shift in the structure of the economy towards finance and business create a mismatch between the elementary skills available in the province and the needs of the evolving economy. Secondly, the capital-intensive petro-chemicals sector also requires skilled people, albeit in small numbers. Thirdly, the roll-out and maintenance of public infrastructure requires artisans, engineers and builders, which cannot be produced in required numbers in the province.

7. The Capacity of the Health System and High Disease Burden

South Africa is in the grip of a quadruple burden of communicable, non-communicable, perinatal and maternal, and injury-related conditions. The morbidity and mortality profiles of the Free State are dominated by HIV/AIDS. In 2009, 70% of the case load in the public health system was accounted for by HIV and AIDS related illnesses. In 2009, as measured by the National Antenatal Sentinel HIV and Syphilis Prevalence Survey, the Free State's HIV prevalence amongst 15-49 year-old antenatal women was 30.1% (95% CI: 28.1% – 32.1%), which is a decrease of 2.8% from the previous year. Primary health care forms the backbone of health care.

In the province, the average clinic serves a population of 8 543 persons, while the corresponding number for South Africa is 10 978 persons. The Primary Health Care (PHC) utilisation rate measures the average number of PHC visits per person per year to a public PHC facility. The national target for this indicator is 3.5 visits. In 2008/09, South Africa as a whole stood at an average of 2.4 visits. The Free State, with a rate of 2.2, was among the three poorest performing provinces in this respect.

There are 236 clinics, 13 community health centres, 99 mobile services, 25 district hospitals, five regional hospitals, one central hospital, and three specialised hospitals in the province. 15 This translates into 4 868 public health facility beds, i.e. 2.1 public sector beds per 1 000 population in the Free State, compared to 2.4 beds per 1 000 population nationally. Additionally, stark spatial disparity is reflected across the province.

The shortage of skilled healthcare professionals also presents a serious challenge in the province, as it does nationally. Not only does it impact on the quality of the service, it also impacts negatively on the management of infrastructure and hospitals. Related concerns include the availability of skilled personnel in relation to service needs based on the burden of disease. This includes the ability of the province to attract and retain scarce skills. When frozen/non-financed posts are included in analysis as per Health Systems Trust data, the picture is not encouraging. In the province in 2010, 48.7% of professional health worker posts were vacant compared to 42.5% nationally. There is also a shortage of doctors and nurses. According to the Health Systems Trust, 42.5% of medical practitioner and 47.4% of professional nurse posts were recorded as vacant in 2010. There were only 24.1 medical practitioners per 100 000 uninsured population in 2010 in the province compared with 27.3 doctors per 100 000 uninsured population nationally.

8. Poverty, Income Inequality and Low Income

At the national level, 48% of households live on less than R322 a month. Access to government grants by 25% of the population is playing an important role in alleviating poverty. At national level, 50% of South Africans live on 8% of national income. Also, the Gini coefficient has increased from 0.56 in 1996 to 0.65 in 2010, which implies that income distribution has become worse.

Poverty remains a huge socio-economic challenge facing the province. The total number of grants paid grew from approximately 98 000 in 1995 to near 850 000 in 2010, this is about 30% of the Free State population. Income inequality in the province has also worsened from 0.59 to 0.64 over the same period. An assessment of poverty in the broader sense reveals that 51.0% of the Free State's population is living in poverty. This means that approximately 1,122,500 people were living in poverty in the province in 2010 compared to 1,393,891 people in 2000. In this context social grants and other government transfers become a major source of income.

The Free State Gross Domestic Product (GDP) per capita income increased from R25 900 in 1996 to R32 304 in 2010. This represents an annual increase of 1.5% compared with the overall economic growth rate of 2.2% since 1996. By comparison, the average annual increase for the Free State is somewhat lower than the 2% p.a. increase for South Africa. Although per capita income has increased, the distribution of this income remains a problem.

The number of people living in poverty grew from just over one million in 1996, to almost 1.7 million in 2004; this represents 55.9% of the total population of the province and a significant increase from 38.6% in 1996. Although poverty is wide spread across the Free State, poverty pockets are closely related to apartheidgenerated displaced settlements in Maluti-a-Phofung, and in Botshabelo and Thaba Nchu.

Evidence suggests that between 1996 and 2004 there was an increase in the Human Development Index for all provinces, which was however, accompanied by a concurrent increase in the Gini-coefficient or inequality. Despite initial gains, the Human Development Index has, since 2004, again gone down in all provinces except in the Western Cape. The high levels of poverty, low incomes and worsening income inequality makes it difficult for many people to fully enjoy access to basic services. Indeed, access to water, electricity, sanitation and housing has dramatically increased since 1994. However the issue of affordability poses a serious challenge, because it leads to cut-offs.

9. The Challenge of Preserving the Environment

Three environmental concerns need to be addressed in the Free State: water availability and quality; climate change; and land use and biodiversity conservation. Water quality management needs to take place at the source, as well as at the level of distribution or use. A recent report assessing water quality data in the Orange River identified gaps in the present monitoring system. These are the discontinuation of sampling at strategic points, poor sampling frequency and important variables not being measured. The Upper Orange Water Management Area (WMA) is a major source of water and of pivotal importance for other WMAs that receive large quantities of water from the Upper Orange WMA. Monitoring programmes assist in understanding the changes that occur in rivers over time

and determine whether the management objectives are being met. River systems must also be audited against the desired state or Resource Quality Objectives.

Climate projections for southern Africa show that the greatest increase in mean temperature will possibly occur over the central interior where the Free State is located. The arid and semi-arid regions towards the western interior are very likely to experience an increase of 2 to 3°C in maximum temperature by 2050, with the strongest increases occurring in spring and autumn. Heat waves are expected not only to occur more often, but last longer and would have a severe influence on soil moisture. As temperatures increase, the number of soil moisture days (days when both soil moisture and temperature are suitable for plant growth) in the western part of the province is expected to decrease by nearly a third by 2050. This could hold severe consequences for agriculture.

The dominant land use in the Free State is agriculture, which accounts for 90% of the total area of the province. Settlement contributes 7% to the existing land use with mining at 0.4% and conservation and tourism areas at 1.6%. All of these land uses have significant impacts on the physical environment and more specifically, biodiversity.

The current human settlements situation shows that urban areas are experiencing increasing pressures as the trend towards urbanisation leads to depopulation of the rural areas. Settlements also have significant ecological footprints at the input and output levels (waste) with environmental impact. Building the capacity of the province to manage household waste and to equip them with green technologies will contribute towards alleviating pressures on the grid and save people's incomes. In addition, the landscape of the province allows for massive opportunities for the harvesting of solar energy.

10. Capacity of the State

One of the key foundations supporting growth and economic development is a capable state. However, a range of governance issues have not always functioned in support of growth and development. One of the first problems relates to the lack of continuity in respect of leadership and senior management in both the provincial and municipal spheres. This problem seems to be a national phenomenon, as described in the National Planning Commission's diagnostic report.

The second problem is high vacancy rates. According to the 2010 Auditor-General's report, the vacancy levels at senior management level in the Free State were the highest in the country. It is especially the vacancy and turnover of municipal managers and municipal chief financial officers which is a matter of concern. The 2010 report by the Public Service Commission (PSC) found "widespread disregard of elementary processes such as compiling job descriptions, conducting job evaluations and obtaining approval of job adverts prior to their placement in the media. These procedural omissions undermine the credibility of the selection process and open the public service up to legal challenges by disgruntled applicants". The PSC further noted that "in 2008, only 16 out of 144 departments submitted their HRD plans [Human Resource Development], translating into an 11.1% compliance rate. This suggests that some departments may not even have these plans in the first place. Furthermore, the PSC found that Personal Development Plans are often completed for the sake of ensuring compliance instead of genuinely identifying training needs that are aligned to actual job performance."

The third problem relates to the nature and structure of strategic planning in the province. Different sets of legislation in different spheres of government and within different departments are not always helpful in ensuring a common provincial vision. Integrated Development Plans (IDPs) also have a range of shortcomings. Their quality is not always good enough and strategic direction is lacking in many cases. Many IDPs are not much more than wish lists and poorly contextualise the intended development outcomes. Planning processes have also, in general, lacked the ability to create new partnerships between government and social partners in order to foster growth and development.

Fourthly, the development of appropriate human resources and human resource capacity to support governance are two of the most challenging areas in the province. A real attempt to attract the best skills to the local government sphere is required. The achievement of coordinated and coherent, as well as integrated planning across the different spheres of government continues to cripple the functioning of municipalities due to the inability to attract skilled people. The lack of structured training and development programmes for staff and councillors on finance, economics, technical and project management have also weakened governance mechanisms in many municipalities.

The fifth problem is that the renewed emphasis on monitoring and evaluation within government requires new sets of skills in planning, operations and reporting. However, the current emphasis on monitoring and evaluation comes at a stage at which it is not yet fully institutionalised within government. Consequently, appropriate intergovernmental relations and systems to foster collaboration are still not well established. Other problems which are prominent include the availability and validity of data, the lack of appropriate norms and standards, as well as the lack of capacity and regulation in other departments.

Whilst indeed there are challenges with regard to technical capacity, it is important that the role of the state in driving and shaping inclusive economic growth and development be emphasised. Institutional capacity will be developed to intervene in areas such as access to markets for targeted sectors. This should include state-driven programmes to systematically integrate marginalised communities into the mainstream economy. The provincial government will also have to position the province and shape the types of infrastructure and the modes in which it is delivered by state-owned enterprises and national government.

3.4 SOCIO-ECONOMIC OVERVIEW OF THE PROPOSED PROJECT AREA

As indicated in Section 1.6.2 Limitations, it is no longer possible to access Census 2001 data at Ward level via the Municipal Demarcation Board. As a result it was not possible to obtain ward level data for the MM. The social baseline for this part of the study area is therefore described at a broader municipal level only. The most recent census data (2011) was used.

The area of jurisdiction of the Moqhaka Local Municipality is situated in the southern part of the Fezile Dabi District Municipality. The former Kroonstad, Steynsrus and Viljoenskroon Transitional Local Councils and sections of the Riemland, Kroonkop and Koepel Transitional Rural Councils are included in the Moqhaka Local Municipality.

The MLM comprises the previous areas of jurisdiction of Kroonstad, Steynsrus and Viljoenskroon Transitional Local Councils and sections of the Riemland, Kroonkop and Koepel Transitional Rural Councils. The Municipal area borders the North West province LMs of Matlosana LM and Tlokwe LM to the North, the Ngwathe LM to the East, the Nketoana LM and Setsoto LM to the south and the Nala LM and Matjabeng LM to the west. The area is accessible principally via the N1 and R76 roads which transverse the Municipal area.

The main urban settlements are Kroonstad, Viljoenskroon and Steynsrus.
Kroonstad with its strong service character and prominent commercial and industrial components, will remain the main town and growth point of the region and will continue to render various services to the surrounding smaller towns and rural areas.

Viljoenskroon is located in an area of agricultural significance and mainly provides services in this regard to the surrounding rural areas. Viljoenskroon functions as a satellite town for residential purposes due to its strategic location in the proximity of the Vaal Reefs mines as well as the Orkney/Stilfontein mining areas in the North West Province. These towns have the opportunity for future growth based on industrial development, mining and tourism.

Steynsrus is located in an area of agricultural significance and mainly provides restricted services in this regard to the surrounding rural communities. Substantial future growth of this town is not foreseen.

Population

The MLM Census 2011 and Community Survey 2016 were used for the statistics.

Table 2 below shows demographic indicator for MLM for 2001 and 2011.

Table 2: Overview of key demographic indicators for the MLM

ASPECT	2001	2011	Change
Population	167 892	160 532	-4.4%
Households	41 514	45 661	+10%
Household size (average)	3,7	3.5	-0.2
% Female headed households	36,5	40,9	+4,4
Sex Ratio (males per 100 females)	99,2	98,1	-1,1
Dependency ratio per 100 (15-64)	51	50,5	-0,5

% Population <15 years	28,1	27	-1,1
% Population 15-64	66,4	66,4	0
% Population 65+	5,7	6,5	+0,8
Unemployment rate (official) - % of economically active population	39,9	35,2	-4,7
Youth unemployment rate (official) - % of economically active population	54,6	47,2	-7,4
No schooling - % of population 20+	10,9	5,4	-5,5
Higher Education - % of population 20+	6,5	8,6	+2,1
Matric - % of population 20+	20	27,8	+7,8

- The table above indicates that the demographic indices for MLM. Population of the municipality has decreased by 4.4% from 167 892 in 2001 to 160 532 persons in 2011. The community survey conducted during 2016 indicated that the population once again decreased with 3.61% to 154 732. Contrary to the aforementioned, the number of households increased by 10.0% from 41 514 in 2001 to 45 661 and increased again with 17.39% to 53 601 according to the Community Survey results of 2016.
- Statistics for age, gender and household size and structure have remained more or less the same.
- Female-headed households have increased largely (from 36,5% to 40,9%).
- There is an improvement with regard to employment and education. While the current unemployment figure remains high (35.2%), both the official and youth unemployment rates have declined significantly, namely by 4,7% and 7,4%, respectively
- With regard to education levels, the portion of the population older than 20 years without formal education has declined by 5,5% to 5,4%. At the same time, the percentages of the adult population with tertiary (+2,1%) and secondary (+7,8%) qualifications have increased.

Table 2.2. Overview of access to basic services in the MLM

	2001	2011	Change
Formal dwellings % of total	82,5	88,7	+6,2
% dwellings owned by occupant	61,4	56,1	-5,3
% households with access to flush toilet	65,6	85,6	+20
% households with weekly municipal refuse removal	67,4	84,9	+17,5
% households with piped water inside dwelling	28,4	57,7	+29,3
% households which uses electricity for lighting	83,8	93,3	+9,5

As indicated by Table 2.2 above:

- The percentage of households living in formal dwellings has increased from 82,5% to 88,7% in 2011. However, the community Survey of 2016 indicates that the percentage of households living in formal dwellings has decreased with 3.3% and the number of households living in informal dwellings has increased with 2.7%.
- Households with access to piped (tap) water inside the dwelling showed a positive movement and increased to 94.2% in 2011, and also the 2016 Community Survey showed a 2% increase from the 2011 Census.
- Significant progress has also been made in respect of access to sanitation whereby households with flush/chemical toilets increased to 88.5% in 2011. The percentage of households utilising pit latrines and bucket toilets declined in the past 15 years. The 2016 Community Survey results shows a further increase in access to sanitation.
- The statistics for 2011 (+9,5%) and Community survey 2016 show that more households utilise electricity for heating, lighting and cooking.
- In respect of access to refuse removal services 85.6% of households in 2011 had their refuse removed at least once a week showing a 16.6% increase compared to 1996. Households utilising their own or communal refuse dumps and with no access to refuse removal services show a comparative decline over the same period. No access to refuse removal information was provided for the 2016 Community Survey.

3.5 LOCAL CONTEXT AND SURROUNDING LAND USES

The proposed Steynsrus SEF is located ~ 4 km northwest of the town of Steynsrus, which is located within the Moqhaka Local Municipality (LM) of the Free State Province, approximately 45 km southeast of the town of Kroonstad, which is located on the N1. Steynsrus is linked to Kroonstad via the R 76, which runs in a north-westerly direction between the two towns. The R 76 also provides a link with the town of Bethlehem to the south east of Steynsrus (~ 90 km). The town of Senekal is located ~ 40 km south of Steyensrus and is linked via the R 720.

Steynsrus is a typical, small rural town that acts as service centre for the surrounding farming area (Photograph 3.1). According to the Moqhaka IDP, Steynsrus has a total population of ~13 000. The Moqhaka IDP identifies the area around Steynsrus as an area of agricultural significance with the main land uses in the area are linked to commercial stock farming (cattle and sheep). The town serves the local agricultural community with basic services (education, healthcare, safety and security, basic provisions etc.). More specialised services are accessed in Kroonstad (population: 166 195)

Photograph 3.1: Entrance to Steynsrus via the R76

The proposed site (Site 1)[3], which covers an area of 20 ha, is located ~ 1km north east of the R 76. The railway line runs along the north eastern boundary of the site. The Steynsrus substation is located adjacent to the south-western boundary of Site 1 (Figure 3.5 and Photograph 3.2).

The topography of the site is generally flat with a gentle slope rising from the R76 in the south west towards the railway line to north east and beyond (Photograph 3.2and 3.2).

[3] Site 2, 3 and 4 are no longer being considered as part of the Basic Assessment.

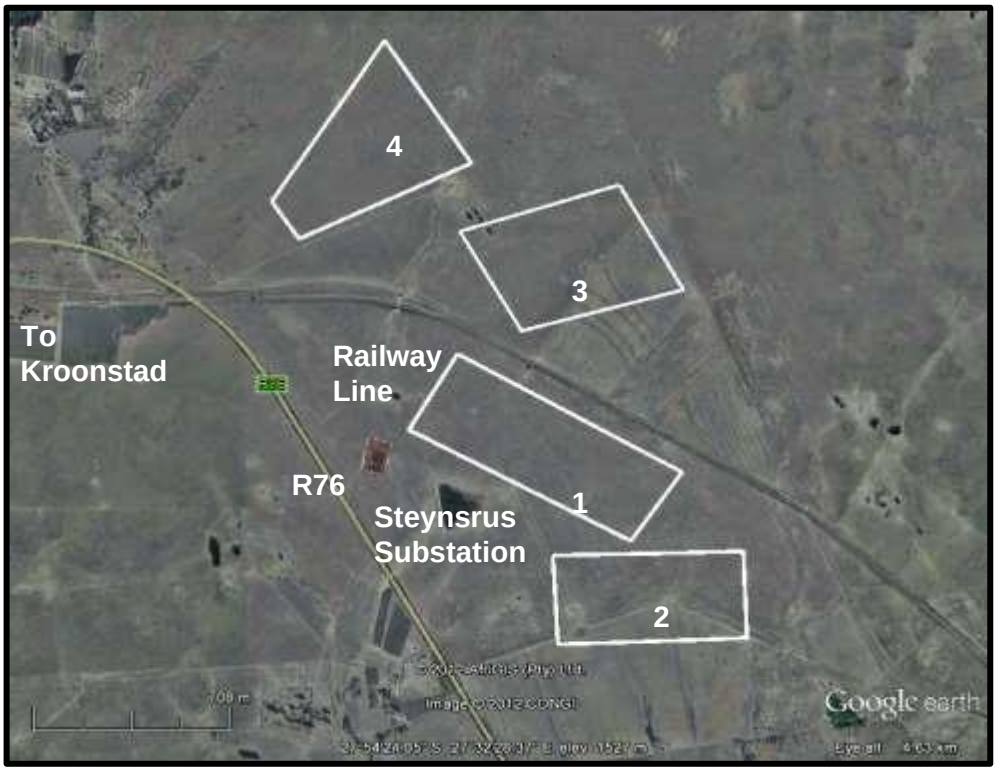


Figure 3.5: Location of Site 1 relative to the 4 initial development sites.

Photograph 3.2: Steynsrus 132 kV substation (from the R76)

Photograph 3.3: View across Site 1 looking north

Photograph 3.4: Railway line to the north east of Site 1 The dominant land use activity on and around the proposed project site is farming, specifically stock farming (Cattle). However, no stock animals were observed on 4 sites at the time of the site visit (December 2012). The area is bisected by a two sets of transmission lines - The Alpha-Beta 2 line that bisects the southern portion of the broader development area running in a southeast-northwest direction; and the Ooosthuizen-Komspruit transmission line that runs through the center of the broader development area in a slightly northeast-southwest direction via the Steynsrus substation.

Photograph 3.5: Ooosthuizen-Komspruit transmission line

Photograph 3.6: Alpha-Beta 2 transmission line

The Steynsrus station is located to the north east of the site and is a state of relative disrepair however, the loop and sidings are still intact and usable (Photograph 3.7). In terms of adjacent homestead, there are no occupied homesteads located in the 20 ha area occupied by Site 1. All of the homesteads in the area are also located outside of the broader development area originally considered (Figure 3.6).

Photograph 1.11: R76 (left) and Steynsrus station (right)

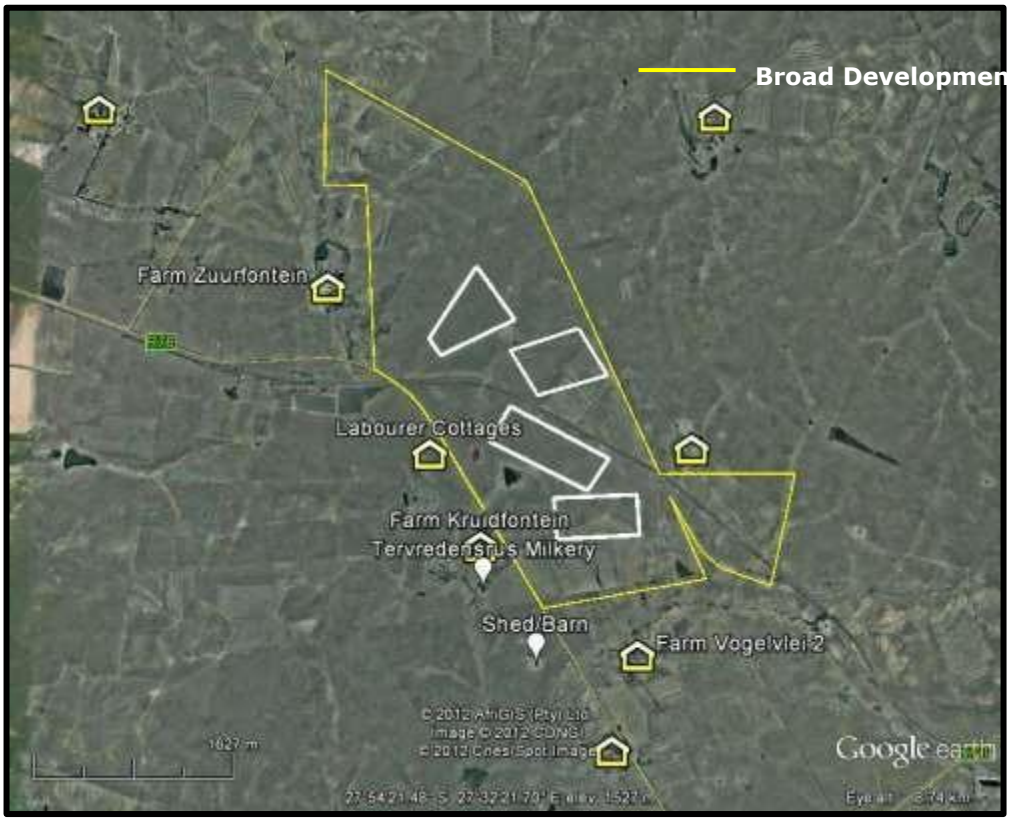


Figure 3.6: Location of homesteads and dwellings relative to Site 1

SECTION 4: ASSESSMENT OF KEY SOCIAL ISSUES

4.1 INTRODUCTION

Section 4 identifies the key social issues identified during the SIA study. The identification of social issues was based on:

- Review of project related information, including other specialist studies;
- Experience with renewable energy projects, including solar energy projects

In identifying the key issues the following assumption is made:

- The area identified for the proposed solar energy plant meets the technical criteria required for such facilities.

4.2 IDENTIFICATION OF KEY SOCIAL ISSUES

The key social issues identified during the SIA can be divided into:

- The policy and planning related issues
- Local, site-specific issues

The local site-specific issues can in turn be divided into construction and operational related issues. These issues are discussed and assessed below. The potential impacts associated with the associated infrastructure (access road, pipeline and power line routes are also assessed.

4.3 POLICY AND PLANNING ISSUES

As indicated in Section 1.4, legislative and policy context plays an important role in identifying and assessing the potential social impacts associated with a proposed development. In this regard a key component of the SIA process is to assess the proposed development in terms of its fit with key planning and policy documents.

The review of the relevant planning and policy documents has been undertaken as a part of the assessment. The key documents reviewed included:

- The National Energy Act (2008);
- The White Paper on the Energy Policy of the Republic of South Africa (December 1998);
- The White Paper on Renewable Energy (November 2003);
- Integrated Resource Plan (IRP) for South Africa (2019)
- Free State Provincial Growth and Development Strategy (2013)-; and
- Moqhaka Local Municipality Integrated Development Plan (2017-2022).

The findings of the review indicated that wind energy development is strongly supported at a national level.

At a national level the While Paper on Energy Policy (1998) notes:

- Renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future;
- The support for renewable energy policy is guided by a rationale that South Africa has a very attractive range of renewable resources, particularly **solar** and wind and that renewable applications are in fact the least cost energy service in many cases; more so when social and environmental costs are taken into account.

The FSPGDS does not specifically make reference to renewable energy. However, there are a number of key provincial priorities that are relevant to the proposed SEF. These include economic development, employment, and investment. The FSPGDS also emphasises the importance of SMME development and the provision of economic infrastructure, which would include energy related infrastructure.

The FSPGDS also identifies a number of natural constraints to economic growth and development. These include, low rainfall coupled with the limited soil potential and the impact of this on agriculture, limited water availability and depletion of mineral resources. What is of interest is that none of the natural constraints impact on the renewable energy sector, specifically the solar energy sector. Solar energy, specifically PV solar energy, therefore provides the Free State with an opportunity to diversify its economy in a way that is not affected by natural constraints such as low rainfall and limited water supplies.

At a local level the Free State Development Corporation (FDC) has identified the potential for solar energy projects in the larger XDM (including the KLM) due to the excellent solar radiation rate in southern XDM (only surpassed by that of Upington) and the availability of land for such developments. In addition, the XDM IDP 2010/11 states that one of its key opportunities is, "*diversifying production of energy from renewable sources such as biomass and rivers and **solar** to ensure both the price competitiveness of agriculture and help meet South Africa's CO_2 reduction targets.*"

At a local level the MMM IDP states that municipality is keen to mitigate the negative impact of climate change by "monitoring the air quality, promoting the energy safe campaigns as well advocating and investing in alternative sources of energy, especially renewable energy such as air and sun".

The findings of the review of the relevant policies and documents pertaining to the energy sector therefore indicate that renewable energy and the establishment of SEFs are supported at a national, provincial and local level. It is therefore the opinion of the authors that the establishment of a solar facility is supported by national, provincial and local policies and planning guidelines.

4.4 SOCIAL IMPACTS ASSOCIATED WITH THE CONSTRUCTION PHASE

The key social issues associated with the construction phase for the Steynsrus Solar Energy Facility include:

Potential positive impacts

- Creation of employment and business opportunities and opportunity for skills development and on-site training

Potential negative impacts

- Impacts associated with the presence of construction workers on site
- Increased risk of stock theft, poaching and damage to farm infrastructure associated with presence of construction workers on the site
- Increased risk of veld fires associated with construction-related activities
- Threat to safety and security of farmers associated with the presence of construction workers on site
- Impact of heavy vehicles, including damage to roads, safety, noise and dust
- Potential loss of grazing land associated with construction-related activities.

4.4.1 Creation of employment and business opportunities

Based on the information from other SEFs the construction phase for the 10 MW each Steynsrus SEF is expected to extend over a period of ~ 12-18 months and create approximately 80 employment opportunities, depending on the final design. The work associated with the construction phase will be undertaken by contractors and will include the establishment of the Steynsrus SEF and the associated components, including, access roads, services and power line.

Based on other renewable energy projects it is anticipated that approximately 60% (48) of the employment opportunities will be available to low (construction labourers, security staff etc.), ~ 25% (20) for semi-skilled workers (drivers, equipment operators etc.) and 15% (12) to skilled personnel (engineers, land surveyors, project managers etc.). The majority of the low-skilled employment opportunities associated with the project are likely to benefit members from the local community. In this regard the majority of the beneficiaries are likely to be historically disadvantaged (HD) members of the community. The low education and skills levels in the area may however hamper potential opportunities for local communities. The majority of the skilled and semi-skilled opportunities are likely to be associated with the contactors appointed to construct the proposed solar park and the associated infrastructure. In this regard the majority of contractors tend to use their own staff and this will limit the potential for direct employment opportunities for locals during the construction phase. In terms of training, the contractors are likely to provide on-site training and skills development opportunities. However, the majority of benefits are likely to accrue to personnel employed by the relevant contractors. In the absence of specific commitments from the developer to employ local contractors the potential for meaningful skills development and training for members from the local communities are likely to be limited.

The capital expenditure on completion is anticipated to be in the region of R 500 million for a 10 MW each facility. In terms of business opportunities for local companies, the expenditure of these sums during the construction phase will create business opportunities for the regional and local economy. However, given the technical nature of the project and high import content associated with solar plants the opportunities for the MLM economy are likely to be limited. However, opportunities are likely to exist for local contractors and engineering companies in Bloemfontein and Kroonstad. Implementing the enhancement measures listed below can enhance these opportunities.

The implementation of the proposed enhancement measures listed below would enable the establishment of the proposed solar park to support co-operation between the public and private sectors in order for the economic development potential of the Free State to be realised. In this regard the FSPGDS highlights the importance of enterprise development, and notes that the current levels of private sector development and investment in the province are low. The proposed solar park therefore has the potential to create opportunities to promote private sector investment and the development of SMMEs in the Free State Province. However, due to the relatively small scale of the project these opportunities are likely to be limited.

The sector of the local economy that is most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport and

security, etc. associated with the construction workers on the site. The majority of construction workers are likely to be accommodated in Bloemfontein, which is the closest town to the site. In addition, a proportion of the total wage bill earned by construction workers over the 16 month construction phase will be spent in the regional and local economy. The total wage bill for the construction phase is estimated to be in the region of R 12 million. This is based on the assumption that the average monthly salary for low skilled, semi-skilled and skilled workers is R 5 000, R 8 000 and R 30 000 respectively for a period of 16 months. A percentage of the wage bill will be spent in the local economy and will create opportunities for local businesses in Steynrus and nearby towns of Kroonstad, Bethlehem and Winburg. The sector of the local economy that is most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport and security, etc. associated with the construction workers on the site. The benefits to the local economy will however be confined to the construction period (12 months).

The hospitality industry in the area, including guest farms and B&Bs, are also likely to benefit from the provision of accommodation and meals for professionals (engineers, quantity surveyors, project managers, product representatives etc.) and other (non-construction) personnel involved on the project. Experience from other construction projects indicates that the potential opportunities are not limited to on-site construction workers but also to consultants and product representatives associated with the project.

Table 4.1: Impact assessment of employment and business creation opportunities during the construction phase

Nature: Creation of employment and business opportunities during the construction phase		
	Without Mitigation	**With Enhancement**
Extent	Local – Regional (2)	Local – Regional (3)
Duration	Very Short Term (1)	Very Short Term (1)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Highly probable (4)
Significance	Low (21)	Medium (32)
Status	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	N/A
Can impact be enhanced?	Yes	
Enhancement : See below		

Cumulative impacts: Opportunity to up-grade and improve skills levels in the area. However, due to relatively small number of local employment opportunities this benefit is likely to be limited.
Residual impacts: Improved pool of skills and experience in the local area. However, due to relatively small number of local employment opportunities this benefit is likely to be limited.

Assessment of No-Go option

There is no impact as it maintains the current status quo. The potential employment and economic benefits associated with the proposed solar park would therefore be forgone. The potential opportunity costs in terms of the capital expenditure, employment, skills development, and opportunities for local business are therefore regarded as a negative.

Recommended enhancement measures

In order to enhance local employment and business opportunities associated with the construction phase the following measures should be implemented:

Employment

- Where reasonable and practical, CCH should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. However, due to the low skills levels in the area, the majority of skilled posts are likely to be filled by people from outside the area.
- Where feasible, efforts should be made to employ local contactors that are compliant with Black Economic Empowerment (BEE) criteria;
- Before the construction phase commences CCH should meet with representatives from the MLM to establish the existence of a skills database for the area. If such as database exists it should be made available to the contractors appointed for the construction phase.
- The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that CCH intends following for the construction phase of the project.
- Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase.
- The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.

Business

- CCH should seek to develop a database of local companies, specifically BEE companies, which qualify as potential service providers (e.g. construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction contractors. These companies should be notified of the tender process and invited to bid for project related work;
- Where possible, CCH should assist local BEE companies to complete and submit the required tender forms and associated information.
- The MLM, in conjunction with the local Chamber of Commerce and representatives from the local hospitality industry, should identify strategies aimed at maximising the potential benefits associated with the project.

Note that while preference to local employees and companies is recommended, it is recognised that a competitive tender process may not guarantee the employment of local labour for the construction phase.

4.4.2 Presence of construction workers in the area

The presence of construction workers poses a potential risk to family structures, social networks and the safety and security of local farmers in the area. In addition there are a number of potentially vulnerable farming activities, such as livestock farming. The potential threat to farming activities is discussed below.

While the presence of construction workers does not in itself constitute a social impact, the manner in which construction workers conduct themselves can impact on the local community. In this regard the most significant negative impact is associated with the disruption of existing family structures and social networks. This risk is linked to the potential behaviour of male construction workers, including:

- An increase in alcohol and drug use;
- An increase in crime levels;
- An increase in teenage and unwanted pregnancies;
- An increase in prostitution;
- An increase in sexually transmitted diseases (STDs).

As indicated above, the majority of construction workers are likely to be from the local area. The potential risk posed by these workers to local communities will therefore be low. These workers will be from the local community and form part of the local family and social network and, as such, the potential impact will be low. The use of local residents to fill the low and semi-skilled job categories will also reduce the need to house construction workers on the site. However, due to the potential mismatch of skills and low education levels, the potential employment opportunities for the members from these local communities may be low.

The potential security and safety risk to local farmers can be effectively mitigated by ensuring that construction workers are not accommodated on site and are transported to and from the site on a daily basis.

Table 4.2: Assessment of impact of construction workers on local communities and farmers

Nature: Potential impacts on family structures, social networks and safety of farmers associated with the presence of construction workers		
	Without Mitigation	**With Mitigation**
Extent	Local (3)	Local (1)
Duration	Very Short Term for community and farmers as a whole (1) Long term-permanent for individuals who may be affected by STD's etc. (5)	Very Short Term for community and famers as a whole (1) Long term-permanent for individuals who may be affected by STD's etc. (5)

Magnitude	Low for the community and local farmers as a whole (4) High-Very High for specific individuals who may be affected by STD's etc. (10)	Low for community and local farmers as a whole (4) High-Very High for specific individuals who may be affected by STD's etc. (10)
Probability	Probable (3)	Probable (3)
Significance	Low for the community and farmers as a whole (24) Moderate-High for specific individuals who may be affected by STD's etc. (51)	Low for the community and farmers as a whole (18) Moderate-High for specific individuals who may be affected by STD's etc. (48)
Status	Negative	Negative
Reversibility	No in case of HIV and AIDS	No in case of HIV and AIDS
Irreplaceable loss of resources?	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods	
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be eliminated	
Mitigation: See below		
Cumulative impacts: Impacts on family and community relations that may, in some cases, persist for a long period of time. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.		
Residual impacts: See cumulative impacts.		

Assessment of No-Go option

There is no impact as it maintains the current status quo. The potential positive impacts on the local economy associated with the additional spending by construction workers in the local economy will also be lost.

Recommended mitigation measures

The potential risks associated with construction workers can be mitigated. The aspects that should be covered include:

- Where possible, CCH should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically semi and low-skilled job categories. This will reduce the potential impact that this category of worker could have on local family and social networks;
- CCH should consider the need to establish a Monitoring Forum (MF) for the construction phase which should be established before the construction phase commences and should include key stakeholders, including representatives from the local community, local councillors, farmers, and the contractor. The role of the MF would be to monitor the construction phase and the implementation of the

recommended mitigation measures. The MF should also be briefed on the potential risks to the local community associated with construction workers;

- CCH and the contractor should, in consultation with representatives from the MF, develop a Code of conduct for the construction phase. The code should identify what types of behaviour and activities by construction workers are not permitted. Construction workers that breach the code of good conduct should be dismissed. All dismissals must comply with the South African labour legislation;
- CCH and the contractor should implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase;
- The movement of construction workers on and off the site should be closely managed and monitored by the contractors. In this regard the contractors should be responsible for making the necessary arrangements for transporting workers to and from site on a daily basis;
- The contractor should make the necessary arrangements for allowing workers from outside the area to return home over weekends and or on a regular basis during the 16 month construction phase. This would reduce the risk posed by construction workers to local family structures and social networks;
- It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay overnight on the site. This will make it possible to manage the potential impacts effectively.

4.4.3 Increased risk of stock theft, poaching and damage to farm infrastructure

The presence of construction workers on the site increases the potential risk of stock theft and poaching. The movement of construction workers on and off the site also poses a potential threat to farm infrastructure, such as fences and gates, which may be damaged. Stock and game losses may also result from gates being left open and/or fences being damaged.

Table 4.3: Assessment of impact of stock theft and damage to farm infrastructure

Nature: Potential loss of livestock, poaching and damage to farm infrastructure associated with the presence of construction workers on site		
	Without Mitigation	**With Mitigation**
Extent	Local (3) (Rated as 4 due to potential severity of impact on local farmers)	Local (2)
Duration	Very Short Term (1)	Very Short Term (1)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (32)	Low (21)
Status	Negative	Negative
Reversibility	Yes, compensation paid for stock losses etc.	Yes, compensation paid for stock losses etc.

Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	Yes
Mitigation: See below		
Cumulative impacts: No**,** provided losses are compensated for		
Residual impacts: See cumulative impacts.		

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
The mitigation measures that can be considered to address the potential impact on livestock, game, and farm infrastructure include:

- CCH should enter into an agreement with the affected landowner/s whereby the company will compensate for damages to farm property and disruptions to farming activities. This includes losses associated with stock theft and damage to property etc.;
- CCH should investigate the option of establishing a MF (see above) that includes local farmers and develop a Code of Conduct for construction workers. Should such a MF be required it should be established prior to commencement of the construction phase. The Code of Conduct should be signed by CCH and the contractors before the contractors move onto site;
- CCH should hold contractors liable for compensating farmers and communities in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between CCH, the contractors and neighbouring landowners. The agreement should also cover loses and costs associated with fires caused by construction workers or construction related activities (see below);
- The EMP must outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested;
- Contractors appointed by CCH should ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.
- Contractors appointed by CCH should ensure that construction workers who are found guilty of stealing livestock, poaching and/or damaging farm infrastructure are dismissed and charged. This should be contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation;
- The housing of construction workers on the site should be limited to security personnel.

4.4.4 Increased risk of veld fires

The presence of construction workers and construction-related activities on the site poses an increased risk of veld fires that in turn pose a threat to the livestock, wildlife,

and farmsteads in the area. In the process, farm infrastructure may also be damaged or destroyed and human lives threatened. The farms in the area are dependent on grazing and any loss of grazing due to a fire would therefore impact negatively on the livelihoods of the affected farmers. The potential risk of veld fires is likely to be higher during the dry, winter months.

Table 4.4: Assessment of impact of increased risk of veld fires

Nature: Potential loss of livestock, crops and houses, damage to farm infrastructure and threat to human life associated with increased incidence of veld fires		
	Without Mitigation	**With Mitigation**
Extent	Local (3) (Rated as 3 due to potential severity of impact on local farmers)	Local (2)
Duration	Very Short Term (1)	Very Short Term (1)
Magnitude	Moderate (6) Due to reliance on livestock for maintaining livelihoods	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (30)	Low (21)
Status	Negative	Negative
Reversibility	Yes, compensation paid for stock and crop losses etc.	
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation: See below		
Cumulative impacts: No, provided losses are compensated for.		
Residual impacts: See cumulative impacts.		

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
SunCorp should enter into an agreement with the affected landowners whereby the company will compensate for damages. This includes losses associated veld fires. In addition, the potential increased risk of veld fires can be effectively mitigated. The

detailed mitigation measures are outlined in the EMP for the construction and operation phases. The aspects that should be covered include:

- Contractor to ensure that open fires on the site for cooking or heating are not allowed except in designated areas;
- Contractor to ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include clearing working areas and avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high risk dry, windy winter months;
- Contractor to provide adequate fire fighting equipment on-site;
- Contractor to provide fire-fighting training to selected construction staff;
- As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire fighting costs borne by farmers and local authorities.

In addition the landowner should ensure that they join the local fire protection agency.

4.4.5 Impact of construction vehicles

The movement of heavy construction vehicles during the construction phase has the potential to damage roads and create noise, dust, and safety impacts for other road users and local communities in the area. Access to the site is likely to be via the R76, which links with the N1 to the west and the R 720, which links with the N5 to the south. The impacts associated with heavy vehicle trips are likely to be low due to the relatively small size of the SEF. The social impacts associated with the movement of construction related traffic are therefore likely to be low. The impact on local farm roads is also likely to be low due to the relatively small scale of the project.

Table 4.5: **Assessment of the impacts associated with construction vehicles**

Nature: Potential noise, dust and safety impacts associated with movement of construction related traffic to and from the site		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Very Short Term (1)	Very Short Term (1)
Magnitude	Low (4)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (21)	Low (12)
Status	Negative	Negative

Reversibility	Yes	
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation: See below		
Cumulative impacts: If damage to roads is not repaired then this will affect the farming activities in the area and result in higher maintenance costs for vehicles of local farmers and other road users. The costs will be borne by road users who were no responsible for the damage.		
Residual impacts: See cumulative impacts		

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
CCH should enter into an agreement with the affected landowners whereby the company will compensate for damages. This includes losses associated with damage to local internal farm roads that are affected by the site. In addition, the potential impacts associated with heavy vehicles and dust can be effectively mitigated. The aspects that should be covered include:

- The contractor must ensure that damage caused to roads by the construction related activities, including heavy vehicles, is repaired before the completion of the construction phase. The costs associated with the repair must be borne by the contractor;
- Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers;
- All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.

4.4.6 Damage to and loss of farmland

The activities associated with the construction phase have the potential to damage farmlands and result in a loss of land available for grazing. The significance of the impacts is to some extent mitigated by the fact that the farming activities on the site are confined to sheep and cattle farming as opposed to crops. In addition, it is standard practice for the affected landowner/s is to enter into a lease agreement that includes monthly rental. The loss of productive farmland would therefore be offset by such an agreement. It may also be possible for livestock and game to graze between the PV panels. The final disturbance footprint can also be reduced by careful site design and placement of components. In addition, the footprint associated with a 10 MW each solar facility is likely to be relatively small (less than 20 ha). The impact on farmland associated with the construction phase can therefore be mitigated by minimising the footprint of the construction related activities and ensuring that disturbed areas are fully rehabilitated on completion of the construction phase. Recommended mitigation measures are outlined below.

Table 4.6: Assessment of impact on farmland due to construction related activities

Nature: The activities associated with the construction phase, such as establishment of access roads and the construction camp, movement of heavy vehicles and preparation of foundations for the SEF and power lines will damage farmlands and result in a loss of farmlands for future farming activities.		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Long term-permanent if disturbed areas are not effectively rehabilitated (5)	Very Short Term if damaged areas are rehabilitated (1)
Magnitude	Moderate, due to importance of farming in terms of local livelihoods (4)	Minor (2)
Probability	Definite (5)	Highly Probable (4)
Significance	Medium (55)	Low (16)
Status	Negative	Negative
Reversibility	No, in case of footprint associated with solar plant	No, in case of footprint associated with solar plant
Irreplaceable loss of resources?	Yes, loss of farmland. However, disturbed areas can be rehabilitated	Yes, loss of farmland. However, disturbed areas can be rehabilitated
Can impact be mitigated?	Yes, however, loss of farmland cannot be avoided	Yes, however, loss of farmland cannot be avoided
Mitigation: See below		
Cumulative impacts: Overall loss of farmland could affect the livelihoods of the affected farmers, their families, and the workers on the farms and their families. However, disturbed areas can be rehabilitated.		
Residual impacts: See cumulative impacts.		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

The potential impacts associated with damage to and loss of farmland can be effectively mitigated. The aspects that should be covered include:

- The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be minimised;

- An Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase;
- All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase;
- The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. The specifications for the rehabilitation programme should be drawn up the Environmental Consultants appointed to undertake the EIA;
- The implementation of the Rehabilitation Programme should be monitored by the ECO.

4.5 SOCIAL IMPACTS ASSOCIATED WITH THE OPERATIONAL PHASE

The key social issues associated with the operational phase of the Steynsrus Solar Energy Facility include:

Potential positive impacts
- Creation of employment and business opportunities. The operational phase will also create opportunities for skills development and training;
- Benefits associated with the establishment of a Community Trust;
- The establishment of renewable energy infrastructure.

Potential negative impacts
- The visual impacts and associated impact on sense of place;
- Potential impact on tourism.

4.5.1 Creation of employment and business opportunities

Based on information from other solar energy projects the proposed solar park is likely to employ approximately 25 full time employees over a 20 year period. Based on information from other renewable projects approximately 10% of the posts will skilled positions and the remaining 90% semi and low skilled positions. The majority of the low-semi-skilled employment opportunities are likely to be taken up by members from the local community. The majority of these opportunities are also likely to benefit Historically Disadvantaged members of the community. It will also be possible to increase the number of local employment opportunities through the implementation of a skills development and training programme linked to the operational phase. Such a programme would support the strategic goals of promoting local employment and skills development contained in the MLM IDP.

Given the location of the proposed facility the majority of permanent staff is likely to reside in Steynrus, Kroonstad or Bethlehem. In terms of accommodation options, a percentage of the permanent employees may purchase houses in the town, while others may decide to rent. Both options would represent a positive economic benefit for the region. In addition, a percentage of the monthly wage bill earned by permanent staff would be spent in the regional and local economy, which will benefit local businesses in these towns. The benefits to the local economy will extend over the 20-year operational lifespan of the project.

The local hospitality industry in the area is also likely to benefit from the operational phase. These benefits are associated with site visits by company staff members and other professionals (engineers, technicians etc.) who are involved in the company and the project but who are not linked to the day-to-day operations.

Table 4.7: Impact assessment of employment and business creation opportunities

Nature: Creation of employment and business opportunities associated with the operational phase		
	Without Mitigation	**With Enhancement**
Extent	Local and Regional (1)	Local and Regional (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Low (27)	Medium (30)
Status	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources?	No	
Can impact be enhanced?	Yes	
Enhancement: See below		
Cumulative impacts: Creation of permanent employment and skills and development opportunities for members from the local community and creation of additional business and economic opportunities in the area		
Residual impacts: See cumulative impacts		

Assessment of No-Go option

There is no impact as it maintains the current status quo. However, the potential opportunity costs in terms of the loss of employment and skills and development training would be lost which would also represent a negative impact.

Recommended enhancement measures

The enhancement measures listed in Section 4.4.1, i.e. to enhance local employment and business opportunities during the construction phase, also apply to the operational phase. In addition:

- CCH should implement a training and skills development programme for locals during the first 5 years of the operational phase. The aim of the programme should be to maximise the number of South African's and locals employed during the operational phase of the project.

4.5.2 Benefits associated with the establishment of a community trust

In terms of the Request for Proposal document prepared by the Department of Energy all bidders for operating licences for renewable energy projects must demonstrate how the proposed development will benefit the local community. This can be achieved by establishing a Community Trust which is funded by revenue generated from the sale for energy.

Community Trusts provide an opportunity to generate a steady revenue stream that is guaranteed for a 20 year period. This revenue can be used to fund development initiatives in the area and support the local community. The long term duration of the revenue stream also allows local municipalities and communities to undertake long term planning for the area. The revenue from the proposed solar park can be used to support a number of social and economic initiatives in the area, including:

- Creation of jobs;
- Education;
- Support for and provision of basic services;
- School feeding schemes;
- Training and skills development;
- Support for SMME's.

The objective of the Trust is to make a tangible difference to the lives of the people in the Local Community for not only the 20 year life of the project but beyond. The development priorities for the trust should be linked to the objectives and projects listed in the local IDP. Each Municipality is required under the terms of the Municipal Systems Act 2000 to develop and publish an Integrated Development Plan (IDP) and to review this plan on an annual basis. This plan essentially maps out a five (5) year development plan for the municipal area. It is a requirement of the IDP process that public consultation and stakeholder engagement take place, specifically including Local Communities, to arrive at a consensus with respect to the broader development priorities of the Municipal area. The comprehensive and inclusive nature of the IDP stakeholder engagement process employed by the Municipality makes the IDP the ideal mechanism for determining the socio-economic development priorities for the Trust.

In addition, the establishment of a SEF is unlikely to have a significant impact on the current agricultural land uses that underpin the local economic activities in the area. The loss of this relatively small area will not impact on the current and future farming activities. Experience has however also shown that Community Trusts can be mismanaged. This issue will need to be addressed in order to maximise the potential benefits associated with the establishment of a Community Trust.

Table 4.8: Assessment of benefits associated with establishment of a community trust

Nature: Establishment of a community trust funded by revenue generated from the sale of energy. The revenue can be used to fund local community development		
	Without Mitigation	**With Enhancement[4]**
Extent	Local (2)	Local and Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Definite (5)
Significance	Medium (30)	Medium (55)
Status	Positive	Positive
Reversibility	N/A	
Irreplaceable	No	
loss of resources?		
Can impact be enhanced?	Yes	
Enhancement: See below		
Cumulative impacts: Promotion of social and economic development and improvement in the overall well-being of the community		
Residual impacts: See cumulative impacts		

Assessment of No-Go option

There is no impact as it maintains the current status quo. However, the potential opportunity costs in terms of the supporting the social and economic development in the area would be lost. This would also represent a negative impact.

Recommended enhancement measures

In order to maximise the benefits and minimise the potential for corruption and misappropriation of funds the following measures should be implemented:

- Clear criteria for identifying and funding community projects and initiatives in the area should be identified. The criteria should be aimed at maximising the benefits for the community as a whole and not individuals within the community;
- Strict financial management controls, including annual audits, should be instituted to manage the funds generated for the community trust from the solar park.

[4] Enhancement assumes effective management of the Community Trust

4.5.3 Development of clean, renewable energy infrastructure

South Africa currently relies on coal-powered energy to meet more than 90% of its energy needs. As a result South Africa is one of the highest per capita producers of carbon emissions in the world and Eskom, as an energy utility, has been identified as the world's second largest producer carbon emissions. The establishment of a clean, renewable energy facility will therefore reduce, albeit minimally, South Africa's reliance on coal-generated energy and the generation of carbon emissions into the atmosphere.

However, the overall contribution of the proposed Steynsrus 10 MW SEF to South Africa's total energy requirements will be small. In addition, the current application is not unique. In this regard, a significant number of solar energy projects are currently proposed in other parts of South Africa. The potential contribution of the proposed Steynsrus SEF should therefore be regarded as valuable, but should not be overestimated.

Table 4.9: Development of clean, renewable energy infrastructure

Nature: Promotion of clean, renewable energy		
	Without Mitigation	**With Mitigation** (The provision of renewable energy infrastructure is in itself a mitigation measure)
Extent	Local, Regional and National (4)	Local, Regional and National (4)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Low (4)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	Medium (40)	Medium (48)
Status	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	Yes, impact of climate change on ecosystems	
Can impact be mitigated?	Yes	
Enhancement: See below		
Cumulative impacts: Reduce carbon emissions via the use of renewable energy and associated benefits in terms of global warming and climate change.		
Residual impacts: See cumulative impacts		

Assessment of No-Go option
The No-Development option would represent a lost opportunity for South Africa to supplement is current energy needs with clean, renewable energy. This would represent a negative opportunity cost.

Recommended mitigation measures
The establishment of the proposed facility is a mitigation measure in itself. In order to maximise the benefits of the proposed project CCH should:

- Implement a training and skills development programme for locals during the first 5 years of the operational phase. The aim of the programme should be to maximise the number of South African's employed during the operational phase of the project;

4.5.4 Visual impact and impact on sense of place

The components associated with the proposed facility will have a visual impact and, in so doing, impact on the landscape and rural sense of the place of the area. Care therefore needs to be taken to ensure that the development of large renewable energy projects not impact on visual character and sense of place of the landscape.

In the case of the proposed Steynsrus SEF there visual character of the area has been impacted by two existing power lines and the Steynrus substation. The potential visual impact on the landscape character of the area is likely to be limited. The key findings of the VIA are summarized below.

Assessment of Impact on Sensitive Receptors in Foreground and Middle Ground

The sensitive receptors in the *fore*-and *middle ground* of the generated viewshed represent mostly users of the road network and the town of Steynsrus itself. The R76 and R720 is the major link roads in the region and is the most sensitive receptors in terms of possible impacts as observers using these roads will come into direct view of the proposed activity. The proposed activity will represent a change in land use and land form to what is currently the status quo. The introduction of foreign structures and forms in the agrarian landscape will have a limited impact on these sensitive receptors.

Assessment of Impact on Sense of Place

Although very weak and not promoted in any way, the sense of place of Steynsrus is very much one of an agricultural town in an agrarian landscape, dotted by agricultural farmsteads. The sense of place attributes and intrinsic values of the project site has, to a large degree, further been lost with the introduction of the electrical substation and associated infrastructure.

In terms of recommendations, the VIA notes that the proposed activity not be established closer than 200m from the R76 in order to establish a proper buffer between the observer and the observed view.

Table 4.10: Visual impact and impact on sense of place

Nature: Visual impact associated with the proposed solar facility and the potential impact on the areas rural sense of place.		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Long term (4)	Long term (4)
Magnitude	Medium (4)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Moderate (30)	Low (21)
Status	Negative	Negative
Reversibility	Yes, solar facility can be removed.	
Irreplaceable loss of resources?	No	
Can impact be mitigated?	Yes	
Enhancement: See below		
Cumulative impacts: Potential impact on current rural sense of place		
Residual impacts: See cumulative impacts		

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
The recommendations contained in the VIA should be implemented.

4.5.5 Impact on tourism

The FSPGDP identifies tourism as an important economic sector. However, based on the findings of the SIA and the VIA the proposed facility is not likely to impact on the tourism sector in the area or the Province. This is due to the relatively small scale of the project and the sites location. The significance of this issue is therefore rated as low negative. In some instances the plant may also attract tourists to the area. However, the significance of this potential benefit is also rated as low positive.

Table 4.11: Impact on tourism

Nature: Potential impact of the solar thermal plant on local tourism		
	Without Mitigation	**With Enhancement / Mitigation**
Extent	Local (2)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	Low (2)
Probability	Probable (3)	Probable (3)
Significance	Low (24) (Applies to both – and +)	Low (27) (Applies to both – and +)
Status	Negative (Potential to distract from the tourist experience of the area) Positive (Potential to attract people to the area)	Negative (Potential to distract from the tourist experience of the area) Positive (Potential to attract people to the area)
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impact be enhanced?	Yes	
Enhancement: See below		
Cumulative impacts: Potential negative and or positive impact on tourism in the Kai! Garib Municipality Area.		
Residual impacts: See cumulative impacts		

Assessment of No-Go option

The No-Development option would represent a lost opportunity to create a facility that has the potential to attract visitors to the area. This would represent a negative opportunity cost.

Recommended enhancement measures

In terms of mitigating the visual impacts, it is virtually impossible to hide the facility.
The impact on the sense of place of the area cannot therefore be effectively mitigated. In terms of efforts to enhance the proposed benefits to tourism:

- CCH should liaise with representatives from the MMM and local tourism representatives to raise awareness of the proposed facility;
- CCH should investigate the option of establishing a renewable energy interpretation centre at entrance to the site. The centre should include a viewing area where passing visitors can stop and view the site;

4.6 ASSESSMENT OF POWER LINE OPTIONS

The social impacts associated with an overhead power line are linked to the visual impact and associated impact on the sense of place and landscape character of the area. An existing substation is located adjacent to the site and therefore only a short power line would be required to connect the facility to the electricity grid. The significance of the impact is therefore rated as low negative. This is due to the relatively short length of the line and presence of an existing substation and power lines located adjacent to the site.

Table 4.12: Assessment of transmission line options

Nature: Potential visual impact and impact on sense of place associated with power lines		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (24)	Low (21)
Status	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impact be mitigated?	Yes	
Enhancement: See below		
Cumulative impacts: Limited visual and impact on sense of place		
Residual impacts: See cumulative impacts		

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
The recommendations contained in the VIA should be implemented. The measures listed above to address the potential impacts associated with the construction phase also apply to the construction of the power line.

4.7 ASSESSMENT OF NO-DEVELOPMENT OPTION

As indicated above, South Africa currently relies on coal-powered energy to meet more than 90% of its energy needs. As a result South Africa is one of the highest per capita producers of carbon emissions in the world and Eskom, as an energy utility, has been identified as the world's second largest producer carbon emissions.

The No-Development option would represent a lost opportunity for South Africa to supplement is current energy needs with clean, renewable energy. Given South Africa's position as one of the highest per capita producer of carbon emissions in the world, this would represent a negative social cost. However, as indicated above, the overall contribution of Steynsrus Solar Energy Facility to South Africa's total energy requirements will be small. In addition, the current application is not unique. The potential contribution of the proposed Steynsrus SEF should therefore be regarded as valuable, but should not be overestimated.

The No-Development option would also result in a loss in employment opportunities associated with both the construction and operational phase. In addition, the benefits associated with the establishment of a Community Trust funded by revenue generated from the sale of energy from the solar park would be forfeited. The revenue from the proposed plant can be used to support a number of social and economic initiatives in the area. These benefits would be forgone if the proposed plant is not developed. Given the limited economic opportunities in the area this would represent a negative social cost for the local community.

Table 4.13: Assessment of no-development option

Nature: The no-development option would result in the lost opportunity for South Africa to supplement is current energy needs with clean, renewable energy. The No-Development option would also result in the loss of the benefits to the local community and economy associated with the creation of employment opportunities and the establishment of a Community Trust.		
	Without Mitigation	**With Enhancement[5]**
Extent	Local-International (3)	Local-International (4)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Moderate (33)	Moderate (36)
Status	Negative	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	Yes, impact of climate change on ecosystems	

[5] Enhancement assumes development of the proposed PVSEF

Can impact be mitigated?	Yes	
Enhancement: See below		
Cumulative impacts: Reduce carbon emissions via the use of renewable energy and associated benefits in terms of global warming and climate change.		
Residual impacts: See cumulative impacts		

Recommended enhancement measures

The proposed facility should be developed and the mitigation and enhancement measures identified in the SIA and other specialist studies should be implemented. However, the impact of large solar facilities on the sense of place and landscape are issues need to be addressed in the location, design and layout of the proposed plant.

4.8 ASSESSMENT OF CUMULATIVE IMPACTS

Although there appear to be no guidelines for solar facilities, the Australian Wind Farm Development Guidelines (Draft, July 2010) indicate that the cumulative impact of multiple wind farm facilities is likely to become an increasingly important issue for wind farm developments in Australia. This finding is also likely to apply to solar energy plants and is also likely to be the case in South Africa. The key concerns in terms of cumulative impacts are, as in the case of wind farms, also likely to be linked to visual impacts and the impact on rural, undeveloped landscapes.

The Scottish Natural Heritage (2005) describes a range of potential cumulative landscape impacts associated with wind farms on landscapes. These issues raised in these guidelines as to what defines a cumulative impact are also regarded as pertinent to solar facilities, specifically given that the key issue of concern is likely to relate to the impact on rural, undeveloped landscapes. The relevant issues raised in the by Scottish Natural Heritage include:

- Combined visibility (whether two or more wind farms (solar facilities) will be visible from one location);
- Sequential visibility (e.g. the effect of seeing two or more wind farms (solar facilities) along a single journey, e.g. road or walking trail);
- The visual compatibility of different wind farms (solar facilities) in the same vicinity.
- Perceived or actual change in land use across a character type or region;
- Loss of a characteristic element (e.g. viewing type or feature) across a character type caused by developments across that character type.

The guidelines also note that cumulative impacts need to be considered in relation to dynamic as well as static viewpoints. The experience of driving along a tourist road, for example, needs to be considered as a dynamic sequence of views and visual impacts, not just as the cumulative impact of several developments on one location. The viewer may only see one wind farm (solar facility) at a time, but if each successive stretch of the road is dominated by views of a wind farm (solar facility), then that can be argued to be a cumulative visual impact (National Wind Farm Development Guidelines, DRAFT - July 2010). It is reasonable to assume that these issues will also apply to solar facilities.

Research on wind farms undertaken by Warren and Birnie (2009) also highlights the visual and cumulative impacts on landscape character. The paper notes that given that aesthetic perceptions are a key determinant of people's attitudes, and that these perceptions are subjective, deeply felt and diametrically contrasting, it is not hard to understand why the arguments become so heated. Because landscapes are often an important part of people's sense of place, identity and heritage, perceived threats to familiar vistas have been fiercely resisted for centuries. The paper also identifies two factors that important in shaping people's perceptions of wind farms' landscape impacts. The first of these is the cumulative impact of increasing numbers of wind farms (Campbell, 2008). The research found that if people regard a region as having 'enough' wind farms already, then they may oppose new proposals. The second factor is the cultural context. This relates to people's perception and relationship with the landscape. In the South African context, the majority of South Africans have a strong connection with and affinity for the large, undisturbed open spaces that are characteristic of the South African landscape. The concerns raised with regard to wind farms and the impact on landscapes are also likely to apply to solar facilities.

The impact of solar facilities on the landscape is therefore likely to be a key issue in South Africa, specifically given South African's strong attachment to the land and the growing number of solar plant applications. With regard to the area, there do not appear to any other solar parks proposed in the immediate vicinity of the site. The potential for significant cumulative impacts is therefore likely to be low. However, the relevant environmental authorities should be aware of the potential cumulative impacts associated with the establishment of renewable energy facilities in the area when evaluating applications.

Table 4.14: Cumulative impacts on sense of place and the landscape

Nature: Visual impacts associated with the establishment of more than one solar plant and the potential impact on the areas rural sense of place and character of the landscape.		
	Without Mitigation	**With Mitigation**
Extent	Local and regional (2)	Local and regional (2)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (24)	Low (24)
Status	Negative	Negative
Reversibility	Yes. Solar energy plant components and other infrastructure can be removed.	
Irreplaceable loss of resources?	No	

Can impact be mitigated?	Yes	
Enhancement: See below		
Cumulative impacts: Impact on other activities whose existence is linked to linked to rural sense of place and character of the area, such as tourism, bird watching, and hunting.		
Residual impacts: See cumulative impacts		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

The establishment of a number of large renewable energy facilities in the area does have the potential to have a negative cumulative impact on the areas sense of place and the landscape. The environmental authorities should consider the overall cumulative impact on the rural character and the areas sense of place before a final decision is taken with regard to the optimal number of such plants in an area.

4.9 ASSESSMENT OF DECOMMISSIONING PHASE

Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live, and the relevant local authorities. However, in the case of the proposed facility the decommissioning phase is likely to involve the disassembly and replacement of the existing components with more modern technology. This is likely to take place in the 20 years post commissioning. The decommissioning phase is therefore likely to create additional, construction type jobs, as opposed to the jobs losses typically associated with decommissioning.

In addition, the social impacts associated with final decommissioned are likely to be limited due to the relatively small number of permanent employees (25) affected. The potential impacts associated with the decommissioning phase can also be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are assessed to be Low (negative).

Recommended mitigation measures

The following mitigation measures are recommended:

- CCH should ensure that retrenchment packages are provided for all staff who stand to lose their jobs when the plant is decommissioned;
- All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning;
- CCH should investigate the option of establishing an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas. The Trust Fund should be funded by a percentage of the revenue generated from the sale of energy to the national grid over the 20 year operational life of the facility. The rationale for the establishment of a Rehabilitation Trust Fund is linked to the

experiences with the mining sector in South Africa and failure of many mining companies to allocate sufficient funds during the operational phase to cover the costs of rehabilitation and closure.

SECTION 5: KEY FINDINGS AND RECOMMENDATIONS

5.1 INTRODUCTION

Section 5 lists the key findings of the study and recommendations. These findings are based on:

- A review of key planning and policy documents pertaining to the area;
- A review of social and economic issues associated with similar developments;
- A review of relevant literature on social and economic impacts;
- The experience of the authors with other renewable energy projects in South Africa.

5.2 SUMMARY OF KEY FINDINGS

The key findings of the study are summarised under the following sections:

- Fit with policy and planning
- Construction phase impacts
- Operational phase impacts
- Cumulative Impacts
- Decommissioning phase impacts
- No-development option

5.2.1 Policy and planning issues

The key documents reviewed included:

- The National Energy Act (2008);
- The White Paper on the Energy Policy of the Republic of South Africa (December 1998);
- The White Paper on Renewable Energy (November 2003);
- Integrated Resource Plan (IRP) for South Africa (2019);
- Free State Provincial Growth and Development Strategy (); and
    - Moqhaka Local Municipality Integrated Development Plan (2017-2022).

The findings of the review indicated that renewable energy is strongly supported at a national, provincial, and local level. Based on this is it reasonable to assume that the establishment of the proposed 5 MW each Steynsrus SEF is supported.

5.2.2 Construction phase

The key social issues associated with the construction phase include:

Potential positive impacts

- Creation of employment and business opportunities, and the opportunity for skills development and on-site training.

The construction phase is expected to extend over a period of 12-18 months and create approximately 80 employment opportunities. It is anticipated that approximately 60 % (48) of the employment opportunities will be available to low skilled (construction labourers, security staff etc.), 25% (20) to semi-skilled workers (drivers, equipment operators etc.) and 15% (12) to skilled personnel (engineers, land surveyors, project managers etc.). The majority of the low-skilled employment opportunities associated with construction phase are, therefore, likely to be available to members from the local community. In this regard the majority of the beneficiaries are likely to be historically disadvantaged (HD) members of the community. The low education and skills levels in the area may however hamper potential opportunities for local communities. The majority of the skilled and semi-skilled opportunities are likely to be associated with the contactors appointed to construct the facility and associated infrastructure.

The total wage bill for the construction phase will be in the region of R 12 million. The injection of income into the area in the form of wages and rental for accommodation will create opportunities for local businesses in Steynsrus, Kroonstad and Bethlehem. The sector of the local economy that is most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport and security, etc. associated with the construction phase. The benefits to the local economy will be confined to the construction period (12-16 months).

The implementation of the proposed enhancement measures listed in the report would enable the establishment of the proposed solar park to support co-operation between the public and private sectors in order for the economic development potential of the Free State to be realised. In this regard the FSPGDS highlights the importance of enterprise development, and notes that the current levels of private sector development and investment in the province are low. The proposed solar park therefore has the potential to create opportunities to promote private sector investment and the development of SMMEs in the Free State Province. However, due to the relatively small scale of the project (10 MW) these opportunities are likely to be limited.

The capital expenditure on completion is anticipated to be in the region of MORE THAN R 500 million for a 10 MW each facility. However, given the technical nature of the project and high import content associated with solar energy projects the potential opportunities for the MLM economy will be limited. However, opportunities are likely to exist for local contractors and engineering companies in Kroonstad, Bethlehem and Winburg.

Potential negative impacts

- Influx of construction workers employed on the project;
- Increased risk of stock theft, poaching and damage to farm infrastructure associated with construction workers;
- Increased risk of veld fires associated with construction related activities;

- Impact of heavy vehicles, including damage to roads, safety, noise and dust; ☐ Loss of agricultural land associated with construction related activities.

The significance of the potential negative impacts with mitigation was assessed to be of Low significance. The majority of the potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. However, the impact on individuals who are directly impacted on by construction workers and or job seekers (i.e. contract HIV/ AIDS) was assessed to be of Medium-High negative significance. In addition, due to the low population density of the area and the relatively small size of the labour force (80) the potential risk to local family structures and social networks is regarded as low. Table 5.1 summarises the significance of the impacts associated with the construction phase.

Table 5.1: Summary of social impacts during construction phase

Impact	**Significance No Mitigation**	**Significance With Mitigation**
Creation of employment and business opportunities	Low (Positive impact)	Medium (Positive impact)
Presence of construction workers and potential impacts on family structures and social networks	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)	Low (Negative impact for community as a whole) Medium-High (Negative impact of individuals)
Risk of stock theft, poaching and damage to farm infrastructure	Medium (Negative impact)	Low (Negative impact)
Risk of veld fires	Medium (Negative impact)	Low (Negative impact)
Impact of heavy vehicles and construction activities	Low (Negative impact)	Low (Negative impact)
Loss of farmland	Medium (Negative impact)	Low (Negative impact)

5.2.3 Operational phase

The key social issues affecting the operational phase include:

Potential positive impacts

- Creation of employment and business opportunities. The operational phase will also create opportunities for skills development and training;
- Benefits associated with the establishment of a community trust.
- The establishment of infrastructure to generate renewable energy.

The total number of permanent employment opportunities is estimated to be in the region of 25. Of this total approximately 80% will be low and medium-skilled and 20%

high skilled positions. The majority of the beneficiaries are therefore likely to be historically disadvantaged (HD) members of the community. Over time it will also be possible to increase the number of local employment opportunities through the implementation of a skills development and training programme linked to the operational phase. Such a programme would support the strategic goals of promoting local employment and skills development contained in the MLM IDP and the FSPGDP.

The establishment of a Community Trust also creates an opportunity to support local economic development in the area. Community Trusts provide an opportunity to generate a steady revenue stream that is guaranteed for a 20 year period. The revenue from the proposed solar plant can be used to support a number of social and economic initiatives in the area, including:

- Creation of jobs;
- Education;
- Support for and provision of basic services;
- School feeding schemes;
- Training and skills development;
- Support for SMME's.

The long term duration of the revenue stream associated with a solar plant linked Community Trust also enables local municipalities and communities to undertake long term planning for the area. Experience has however also shown that Community Trusts can be mismanaged. This issue will need to be addressed in order to maximise the potential benefits associated with the establishment of a Community Trust.

The proposed development also represents an investment in infrastructure for the generation of clean, renewable energy, which, given the challenges created by climate change, represents a positive social benefit for society as a whole.

Potential negative impacts

- The visual impacts and associated impact on sense of place and the landscape;
- Impact on tourism.

The visual impacts on landscape character associated with large renewable energy facilities, such as solar thermal plants, are highlighted in the research undertaken by Warren and Birnie (2009). In the South African context, the majority of South Africans have a strong connection with and affinity for the large, undisturbed open spaces that are characteristic of the South African landscape. The impact of solar energy plants on the landscape is therefore likely to be a key issue in South Africa, specifically given South African's strong attachment to the land and the growing number of solar energy applications. The visual impacts associated with the proposed Steynsrus SEF are, however, likely to be low due to the existing power lines in the area and its relatively small size. The significance of the impacts associated with the operational phase are summarised in Table 5.2.

Table 5.2: Summary of social impacts during operational phase

Impact	Significance No Mitigation	Significance With Mitigation
Creation of employment and business opportunities	Low (Positive impact)	Medium (Positive impact)
Benefits associated with the establishment of a community trust	Medium (Positive impact)	Medium (Positive impact)
Establishment of infrastructure for the generation of renewable energy	Medium (Positive impact)	Medium (Positive impact)
Visual impact and impact on sense of place	Medium (Negative impact)	Low (Negative impact)
Impact on tourism	Low (Positive and Negative)	Low (Positive and Negative)

5.2.4 Assessment of cumulative impacts

The cumulative impacts associated with solar energy facilities, such as the proposed Steynsrus SEF are largely linked to the impact on sense of place and visual impacts. In the case of the proposed Steynsrus SEF there visual character of the area has been impacted by two existing power lines and the Steynrus substation. The significance of the potential cumulative social impacts, specifically the impact on the landscape, was rated to be low.

However, it is recommended that the environmental authorities consider the overall cumulative impact on the rural character and the areas sense of place before a final decision is taken with regard to the optimal number of solar energy facilities in the area. In addition, the siting and number of individual components of the plant should be informed by findings of the relevant VIAs, specifically with respect to the visual impact on farmsteads and important roads in the area.

5.2.5 Transmission line options

The findings of the SIA indicate that the impacts associated with the proposed overhead power line will be low.

5.2.6 Assessment of no-development option

The No-Development option would represent a lost opportunity for South Africa to supplement is current energy needs with clean, renewable energy. Given South Africa's position as one of the highest per capita producer of carbon emissions in the world, this would represent a High negative social cost.

The no-development option also represents a lost opportunity in terms of the employment and business opportunities (construction and operational phase) associated

with the proposed solar park and the benefits associated with the establishment of a Community Trust. This also represents a negative social cost.

5.2.7 Decommissioning phase

Due to the relatively small number of people affected (~25) the social impacts associated with the decommissioning of the facility are likely to be low. In addition, the potential impacts can be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are assessed to be Low (negative).

CCH should also investigate the option of establishing an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas. The Trust Fund should be funded by a percentage of the revenue generated from the sale of energy to the national grid over the 20 year operational life of the facility. The rationale for the establishment of a Rehabilitation Trust Fund is linked to the experiences with the mining sector in South Africa and failure of many mining companies to allocate sufficient funds during the operational phase to cover the costs of rehabilitation and closure.

5.3 CONCLUSIONS AND RECOMMENDATIONS

The findings of the SIA indicate that the development of the proposed 10 MW Steynsrus SEF will create employment and business opportunities for locals during both the construction and operational phase of the project. The establishment of a Community Trust funded by revenue generated from the sale of energy will also create an opportunity to support local economic development in the area. This represents a social benefit for an area where there are limited opportunities.

The proposed development also represents an investment in clean, renewable energy infrastructure, which, given the challenges created by climate change, represents a positive social benefit for society as a whole. The establishment of the proposed Steynsrus SEF is therefore supported by the findings of the SIA.

5.4 IMPACT STATEMENT

The findings of the SIA undertaken for the proposed 10 MW Steynsrus SEF indicate that the potential social benefits associated with the project outweigh the potential negative social impacts. The establishment of a Community Trust also creates an opportunity to support local economic development in the area. The proposed development also represents an investment in clean, renewable energy infrastructure, which, given the challenges created by climate change, represents a positive social benefit for society as a whole.

It is therefore recommended that the 10 MW Steynsrus SEF as proposed be supported, subject to the implementation of the recommended mitigation measures and management actions contained in the report.

ANNEXURE A

Interviews

A number of adjacent landowners were also not available at the time that the site visit was conducted. The following persons were interviewed as part of the BA:

- Mr. Saaiman, landowner;
- Mr Gerhardus Saaiman (Landowner, Kruidevlei);
- Mr CW Moller (Landowner, Vogelveli 2).

References

- Free State Provincial Growth and Development Strategy (2013)
- Integrated Resource Plan (IRP) for South Africa (2010);
- Fezile Dabi Integrated Development Plan (2011-2012);
- Moqhaka Local Municipality Integrated Development Plan (2017-2022)
- Moqhaka Local Municiplaity Annual Report (2021/22);
- StatsSA Community Survey, 2016;
- The National Energy Act, 2008;
- The White Paper on Renewable Energy, November 2003; and
- The White Paper on the Energy Policy of the Republic of South Africa, December 1998;
- Visual Impact Assessment, Zone Land Solutions, June 2013

Internet sources

- www.demarcation.org.za (Census 2001 data);
- www.saps.gov.za/statistics/reports/crimestats/2012/provinces/freestate/pdf/steynsrus.pdf (Crime in Steynsrus (FS) for April to March 2003/2004 – 2011/2012)
- www.en.wiki.org;
- Google Earth 2013.

ANNEXURE B

METHODOLOGY FOR THE ASSESSMENT OF POTENTIAL IMPACTS

Direct, indirect and cumulative impacts of the above issues, as well as all other issues identified will be assessed in terms of the following criteria:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, where it will be indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score between 1 and 5 will be assigned as appropriate (with a score of 1 being low and a score of 5 being high).

- The **duration**, where it will be indicated whether:
  - ☐ the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - ☐ the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  - ☐ medium-term (5–15 years) – assigned a score of 3;
  - ☐ long term (> 15 years) - assigned a score of 4; or
  - ☐ permanent - assigned a score of 5.
- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
  - ☐ 0 is small and will have no effect on the environment;
  - ☐ 2 is minor and will not result in an impact on processes;
  - ☐ 4 is low and will cause a slight impact on processes;
  - ☐ 6 is moderate and will result in processes continuing but in a modified way;
  - ☐ 8 is high (processes are altered to the extent that they temporarily cease); and
  - ☐ 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability** *of occurrence*, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale, and a score assigned:
  - ☐ Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
  - ☐ Assigned a score of 2 is improbable (some possibility, but low likelihood);
  - ☐ Assigned a score of 3 is probable (distinct possibility);
  - ☐ Assigned a score of 4 is highly probable (most likely); and
  - ☐ Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- The **significance**, which shall be determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- The **status**, which will be described as either positive, negative or neutral.
- The *degree* to which the impact can be *reversed*.
- The *degree* to which the impact may cause *irreplaceable loss of reso*urces.
- The *degree* to which the impact can be *mitigated.*

The **significance** is determined by combining the criteria in the following formula:

S=(E+D+M)P; where

S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),

- > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

ANNEXURE C

ENVIRONMENTAL MANAGEMENT PROGRAMME: SIA

CONSTRUCTION PHASE

Creation of employment and business opportunities

OBJECTIVE: Maximise local employment and business opportunities associated with the construction phase.

Project component/s	Construction and establishment activities associated with the establishment of the PV facility, including infrastructure etc.		
Potential Impact	The opportunities and benefits associated with the creation of local employment and business should be maximised.		
Activity/risk source	The employment of outside contractors to undertake the work and who make use of their own labour will reduce the employment and business opportunities for locals. Employment of local labour will maximise local employment opportunities.		
Mitigation: Target/Objective	CCH, in discussions with the MMM, should aim to employ a minimum of 80% of the low-skilled workers from the local area. This should also be made a requirement for all contractors. CCH should also develop a database of local BEE service providers		
Mitigation: Action/control		Responsibility	Timeframe

• Attempt to employ a minimum of 80% of the lowskilled workers are sourced from the local area; • Where required, implement appropriate training and skills development programmes prior to the initiation of the construction phase to ensure that 80% target is met. • Skills audit to be undertaken to determine training and skills development requirements; • Develop a database of local BEE service providers and ensure that they are informed of tenders and job opportunities; • Identify potential opportunities for local businesses	• CCH & contractors • CCH • CCH • CCH • CCH	• Employment and business policy document that sets out local employment targets to be in place before construction phase commences. • Where required, training and skills development programmes to be initiated prior to the initiation of the construction phase. • Skills audit to determine need for training and skills development programme undertaken within 1 month of commencement of construction phase commences. • Database of potential local BEE services providers to be completed before construction phase commences.

Performance Indicator	☐ Employment and business policy document that sets out local employment and targets completed before construction phase commences; ☐ 80% of semi and unskilled labour locally sourced. ☐ Database of potential local BEE services providers in place before construction phase commences. ☐ Skills audit to determine need for training and skills development programme undertaken within 1 month of commencement of construction phase.
Monitoring	☐ CCH and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.

Impact associated with presence of construction workers

OBJECTIVE: Avoid the potential impacts on family structures and social networks associated with presence of construction workers from outside the area

Project component/s	Construction and establishment activities associated with the establishment of the PV facility, including infrastructure etc.
Potential Impact	The presence of construction workers who live outside the area and who are housed in local towns can affect family structures and social networks.
Activity/risk source	The presence of construction workers can affect negatively on family structures and social networks, especially in small, rural communities.
Mitigation: Target/Objective	To avoid and or minimise the potential impact of construction workers on the local community. This can be achieved by maximising the number of locals employed during the construction phase and minimising the number of workers housed on the site.

Mitigation: Action/control	Responsibility	Timeframe
• Attempt to ensure that a minimum of 80% of the low skilled workers are sourced from the local area. This should be included in the tender documents. Construction workers should be recruited from the local area in and around the Bloemfontein. • Local construction workers should be able to provide proof of having lived in the area for five years or longer. • Identify local contractors who are qualified to	• CCH and contractors • CCH • CCH	• Identify suitable local contractors prior to the tender process for the construction phase. • Tender documents for contractors include conditions set out in SIA, including transport of workers home over weekends, transportation of workers home on completion of construction phase, establishment of MF etc.,

undertaken the required work. • Develop a Code of Conduct to cover the activities of the construction workers housed on the site. • Ensure that construction workers housed attend a brief session before they commence activities. The aim of the briefing session is to inform them of the rules and regulations governing activities on the site as set out in the Code of Conduct. • Ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct. • Ensure that construction workers who are found guilty of breaching the Code of Conduct are dismissed. All dismissals must be in accordance with South African labour legislation. • Provide opportunities for workers to go home over weekends. The cost of transporting workers home over weekends and back to the site should be borne by the contractors. • On completion of the construction phase all construction workers must be transported back to their place of origin within two days of their contract ending. The costs of transportation must be borne by the contractor.	• CCH • CCH and contractors • CCH and contractors • Contactors • Contractors • Contractors	• MF established before construction phase commences. • Code of Conduct drafted before construction phase commences. • Briefing session for construction workers held before they commence work on site.

Performance Indicator	• Employment policy and tender documents that sets out local employment and targets completed before construction phase commences; • 80% of semi and unskilled labour locally sourced; • Local construction workers employed have proof that they have lived in the area for five years or longer; • Tender documents for contractors include recommendations for construction camp; • MF set up prior to implementation of construction phase; • Code of Conduct drafted before commencement of
	construction phase; ☐ Briefing session with construction workers held at outset of construction phase;
Monitoring	☐ CCH and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.

Safety, poaching, stock theft and damage to farm infrastructure

OBJECTIVE: To avoid and or minimise the potential impact of the activities during the construction on the safety of local communities and the potential loss of stock and damage to farm infrastructure.

Project component/s Potential Impact	Construction and establishment activities associated with the establishment of the PV facility, including infrastructure etc. Impact on safety of farmers and communities (increased crime etc.) and potential loss of livestock due to stock theft by construction workers and also damage to farm infrastructure, such as gates and fences.		
Activity/risk source	The presence of construction workers on the site can pose a potential safety risk to local farmers and communities and may result in stock thefts. The activities of construction workers may also result in damage to farm infrastructure.		
Mitigation: Target/Objective	To avoid and or minimise the potential impact on local communities and their livelihoods.		
Mitigation: Action/control		Responsibility	Timeframe

• Consider establishing a MF with the adjacent farmers and develop a Code of Conduct for construction workers. • Inform all workers of the conditions contained in the Code of Conduct. • Dismiss all workers that do not adhere to the code of conduct for workers. All dismissals must be in accordance with South African labour legislation. • Compensate farmers / community members at full market related replacement cost for any losses, such as livestock, damage to infrastructure etc.	• CCH and contractors • CCH • CCH and contractor • Contractors	• Establish MF before construction phase commences. • Develop Code of Conduct prior to commencement of construction phase. The Code of Conduct should be signed by SunCorp and the contractors before the contractors move onto site; • Inform all construction workers of Code of Conduct requirements before construction phase commences. • Compensate farmers / community members within 1 month of claim being verified by SunCorp and or Contractor/s.
Performance Indicator	• Community MF in place before construction phase commences. • Code of Conduct developed and approved prior to commencement of construction phase. • All construction workers made aware of Code of Conduct within first week of being employed.	

	☐ Compensation claims settled within 1 month of claim being verified by Community MF.
Monitoring	☐ CCH and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.

Increase risk of veld fires

OBJECTIVE: To avoid and or minimise the potential risk of increased veld fires during the construction phase.

Project component/s Potential Impact	Construction and establishment activities associated with the establishment of PV facility, including infrastructure etc. Veld fires can pose a personal safety risk to local farmers and communities, and their homes, crops, livestock and farm infrastructure, such as gates and fences.
Activity/risk source	The presence of construction workers and their activities on the site can increase the risk of veld fires.
Mitigation: Target/Objective	To avoid and or minimise the potential risk of veld fires on local communities and their livelihoods.

Mitigation: Action/control	Responsibility	Timeframe
• Ensure that open fires on the site for cooking or heating are not allowed except in designated areas. • Provide adequate fire fighting equipment onsite. • Provide fire-fighting training to selected construction staff. • Compensate farmers / community members at full market related replacement cost for any losses, such as livestock, damage to infrastructure etc. • Join Fire Protection Agency	• CCH and contractors • CCH and contractors • Contractors • Contractors	• Ensure that these conditions are included in the Construction Phase EMP. • Ensure that designated areas for fires are identified on site at the outset of the construction phase. • Ensure that fire fighting equipment and training is provided before the construction phase commences. • Compensate Farmers within 1 month of claim being verified by MF.

Performance Indicator	• Conditions contained in the Construction EMP. • Designated areas for fires identified on site at the outset of the construction phase. • Fire fighting equipment and training provided before the construction phase commences. • Compensation claims settled within 1 month of claim being verified by Community MF.
Monitoring	☐ CCH and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.

Impact of dust and noise due to heavy vehicles and damage to roads

OBJECTIVE: To avoid and or minimise the potential impacts of safety, noise and dust and damage to roads caused by construction vehicles during the construction phase.

Project component/s	Construction and establishment activities associated with the establishment of the PV facility, including infrastructure etc.
Potential Impact	Heavy vehicles can generate noise and dust impacts. Movement of heavy vehicles can also damage roads.
Activity/risk source	The movement of heavy vehicles and their activities on the site can result in noise and dust impacts and damage roads.
Mitigation: Target/Objective	To avoid and or minimise the potential noise and dust impacts associated with heavy vehicles, and minimise damage to roads.

Mitigation: Action/control	Responsibility	Timeframe
• Implement dust suppression measures for heavy vehicles such as wetting roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.	• Contractors	• Ensure that these conditions are included in the Construction Phase EMP. • Ensure that dust suppression measures are implemented for all heavy vehicles that require such measures during the construction phase commences.
• Ensure that all vehicles are road-worthy; drivers are qualified and are made aware of the potential noise, dust and safety issues.	• Contractors	• Ensure that drivers are made aware of the potential safety issues and enforcement of strict speed limits when they are employed.
• Ensure that drivers adhere to speed limits. Vehicles should be fitted with recorders to record when vehicles exceed the speed limit.	• Contractors	• Fit all heavy vehicles with speed monitors before they are used in the construction phase.
• Ensure that damage to roads is repaired before completion of construction phase;	• Contractors	• Assess road worthy status of heavy vehicles at the outset of the construction phase and on a monthly basis thereafter; • Ensure that damage to roads is repaired before completion

		of construction phase.
Performance Indicator	• Conditions included in the Construction Phase EMP. • Dust suppression measures implemented for all heavy vehicles that require such measures during the construction phase commences. • Drivers made aware of the potential safety issues and enforcement of strict speed limits when they are employed. • All heavy vehicles equipped with speed monitors before they are used in the construction phase. • Road worthy certificates in place for all heavy vehicles at outset of construction phase and up-dated on a monthly basis.	
Monitoring phase	☐ CCH and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction	

Impact on farming activities

OBJECTIVE: To avoid and or minimise the potential impact on current and future farming activities during the construction phase.

Project component/s	Construction phase activities associated with the establishment of the PV facility and associated infrastructure.
Potential Impact	The footprint of the solar energy plant and associated infrastructure will result in a loss of land that will impact on farming activities on the site.
Activity/risk source	The footprint taken up by the solar energy plant and associated infrastructure.
Mitigation: Target/Objective	To minimise the loss of land taken up by the PV facility and associated infrastructure and to enable farming activities to continue where possible, specifically grazing.

Mitigation: Action/control	Responsibility	Timeframe

• Minimise the footprint of the PV facility and the associated infrastructure. • Rehabilitate disturbed areas on completion of the construction phase. Details of the rehabilitation programme should be contained in the EMP.	• Contractor and CCH • ECO and Contractors	• Footprint for PV facility should be defined in the Construction EMP before construction phase commences. • Rehabilitation should be ongoing and completed within 3 months of the completion of the construction phase. • Meeting/s with local farmers to discuss lease options should take place during the construction phase.

Performance Indicator	☐ Footprint of PV facility included in the Construction Phase EMP. ☐ Meeting/s held with farmers during construction phase.
Monitoring	☐ ECO must monitor indicators listed above to ensure that they have been met for the construction phase. ☐ 5 year training and skills development programme developed and designed before construction phase completed. • Potential locals identified before construction phase completed. ☐ CCH must monitor indicators listed above to ensure that they have been met for the operational phase

DECOMMISSIONING PHASE

Impact of decommissioning

OBJECTIVE: To avoid and or minimise the potential impacts associated with the decommissioning phase.

Project component/s	Decommissioning phase of the PV facility
Potential Impact	Decommissioning will result in job losses, which in turn can result in a number of social impacts, such as reduced quality of life, stress, depression etc. However, the number of people affected (20-25) is relatively small. Decommissioning is also similar to the construction phase in that it will also create temporary employment opportunities.
Activity/risk source	Decommissioning of the PV facility
Mitigation: Target/Objective	To avoid and or minimise the potential social impacts associated with decommissioning phase of the PV facility.

Mitigation: Action/control	Responsibility	Timeframe
☐ Retrenchments should comply with South African Labour legislation of the day	☐ CCH	☐ When PV facility is decommissioned
Performance Indicator	☐ South African Labour legislation relevant at the time	
Monitoring	☐ CCH and Department of Labour	